LEADWELL®

INSTRUCTION MANUAL

T-7M

SIEMENS 802D-SL

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PREFACE

Thank you for purchasing the CNC MACHINE TURNING CENTER. We at Leadwell are confident your purchase will greatly expand your work capacity and efficiency. This instruction manual has been prepared to assist you on ordering replacement, servicing parts, technical problem and maintenance. If you have any question on your machine or this publication, please contact your ***Leadwell dealer*** or ***local agent***.

BRIEF INTRODUCTION OF LEADWELL

Founded in 1980, Leadwell CNC Machines Mfg., Corp., is now the most professional CNC machine tool maker in Taiwan. Leadwell is constantly searching for perfection by upgrading the performance, product quality and reliability of its products which range from CNC Vertical /Horizontal Machining Centers, Turning Centers, Plastic Injection Molding Machines, Grinders, Tapping/Drilling Machines to Laser Cutting Machines, 5-face Machining Centers, Double Housing Planking Machine, Flexible Manufacturing Systems(FMS) .

In 1993 Leadwell received the Outstanding Product Award --SYMBOL OF EXCELLENCE and its quality passed ISO 9002 recognition. Hence, Leadwell products are recognized as highly reliable. In October, 1997 Leadwell has received the National Quality Award by the Executive Yuan, R.O.C. We have developed our products total quality management with outstanding result. January of 1999, the grate month, Leadwell passed a certification of CNS 14001 from the Bureau of Commodity Inspection And Quarantine(BCIQ) Ministry of Economic Affairs Taiwan.

The highest guiding principle for quality management in Leadwell is 『Quality is our life and dignity』, we constantly work for developing more high quality, more high technical and offer faster service. We also go after excellent quality and management to win the custmors' respect to be No.1 all over the world.

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Safety Regulation

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1. Safety Regulation.

1.1 Check Points for Safe Operation

When using your CNC lathe, always make sure the following conditions or operations are in effect. Failure to this will reduce cutting accuracy and may be the cause of accidents.

(1).When chucking a workpiece, check both the chucking method and the pressure while considering the rigidity of the workpiece so as not to cause chucking distortion.

(2).Make sufficient chucking allowance so that the workpiece cannot jump out from the chuck, either by cutting force or centrifugal force of the spindle. The workpiece may be supported by the tailstock, if necessary.

(3).If the workpiece is an eccentric or irregular shape, so that the center of gravity or the workpiece is outside the center of rotation, this eccentricity will cause the spindle vibrate during rotation, adversely affecting overall cutting accuracy. To counteract this, attach a balance for the workpiece.

(4).If chips are stuck to the workpiece or to the tool, the desired accuracy of cutting face may not be obtained, Select appropriate tools to prevent chips from sticking to the tool and workpiece

(5).Before selecting tools, check the tools thoroughly so as to prevent any interference between the tool and workpiece, chuck, jaw, tailstock, cover, etc..

(6).A wide variety of materials and shapes are used as workpieces to be cut. Always set the appropriate cutting conditions for each material and shape to obtain the desired accuracy of the particular product.

(7).At actuation of the machine an before cutting, warm up the spindle and move the turret and slideways for a period of time to reach proper operating temperature. This is necessary to reduce the influence on the workpiece by thermal displacement.

(8).When cutting the bar material using a bar feeder and a hole through spindle, use only absolutely straight bar material since the accuracy of the workpiece is influenced by curve of the bar material.

1.2 Safety Rules for this machine

1.2.1 Safety Practices

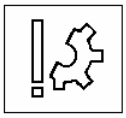
Each machine is shipped with a variety of built-in safety devices. To prevent such a situation from occurring, all operators must carefully read the manual supplied by NC unit manufacturer and Leadwell so that they understand the machine before trying to operate it.

Because there are so many "things which cannot be done" and "things which must not be done, "all prohibited information cannot be specified in the instruction manual. Assume that something is impossible unless the manual specifically states that "it can be done".

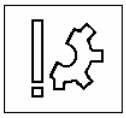
The following pages describe fundamental safety information. All the items described must be carefully observed when operating the machine or performing maintenance work. Failure to observe fundamental safety information can lead to serious operator injury and machine damage. All operators must strictly follow the information.

[Signal Word Definition]

DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damages to the machine.

NOTE
Indicates comments and items for which car should be exercised.

CONTACT
Indicates should contact with service department .

1.2.2 Machine Installation Precautions

Installation Site:

(1) Allow space for maintenance.
Install the machine so that the doors of the machine and the NC unit can be opened without interference.

(2) Do not put things on the floor around the machine.
Keep the floor dry. If coolant or lubricating oil is spilled. Wipe it up immediately.

(3) The machine and the NC unit must not be subject to direct sunlight. Chips, coolant, and oil must not be splashed on the machine or the NC unit.
The machine and the NC unit must not subject to any excessive vibrations.
Ambient temperature: 0 to 40℃
Humidity: 75%RH or less（without condensation）

(4) Make sure that the floor is strong enough to support the machine. The floor must not be sloped or irregular in any way.

(5) A number of cooling fans are used inside the floor. Therefore, dust and mist must be kept to a minimum.

(6) Allow space for easy removal of the chip conveyor and the coolant tank.

Power Supply:

(1) Only an authorized electrical technician should perform work with the power cable connections.

(2) No electrical noise generating sources, such as electric welders or electric discharge machines, can be near the machine. Take care to insulate the machine from any adverse effects that might be caused by nearby equipment.

(3) An excessive voltage drop due to an insufficient power capacity will cause a malfunction of the NC unit. The power cables must be connected directly and independently to the plant power distribution panel.

Allowable values:

*Voltage……..…±10% of nominal supply voltage.

*Frequency……50/60 Hz ± 1 Hz.

*Momentary power failure…....Less than 10 msec.

*Voltage impulse……...Leak value is 200% or less of the effective value (rms value) of the line voltage with pulse duration of 1.5 msec.

*Waveform distortion……7% or less

*Imbalance in line voltages……5% or less

Grounding:

(1) The machine must be grounded independently of other machines.

(2) If electric welders or electric discharge machines are grounded to the frame of the plant building, do not connect the ground wire of the machine to the plant frame.

(3) The ground wire must be as short as possible and have the same diameter as the input power cable.

Class 3 ground
Grounding resistance: 100Ω or less

(4) Please measures the ground wire to earth, exactly. The grounding resistance must be less than 100Ω with the single device.

Air Supply:

(1) Use only clean and dry air.

(2) Make sure that the air source can supply the specified volume of air.

Installation:

(1) To hoist the machine, be sure to follow the precautions bellow.

1) Only an authorized technician should perform work with the machine hoistion.

2) Use only wires, shackles, and jigs of the dimensions specified in the manual. They must be strong enough to support the weight of the machine.

3) Before hoisting the machine, make sure that each of the units is fixed securely.

4) Before hoisting the machine, make sure that each of the units is fixed securely.

5) Be sure that the machine is well balanced both lengthwise and crosswise while hoisting the machine slightly shove the floor.

6) When a plurality of workers are in operation, be sure to call attention each other as necessary.

(2) If rust prevention coating is applied to the slideway surfaces, it must be removed completely. If any rust prevention coating is left on the slideway when the machine power is turned ON, a servo alarm will occur.

(3) The carriage and cross slide are fixed in place with transit clamps when the machine is shipped. Also, eyebolts are used to hoist the machine. These clamps and eyebolts must be removed before turning ON the power.

(4) After installing the machine, the machine must be leveled. The machine's crown and distortion values must be adjusted according to the Accuracy Test Results Chart delivered with the machine.

(5) Keep the door interlock switch in the ON position. Remove the key and store it in a safe place.

Before turning On The Power After Installation:

After completing machine installation, check the following points before turning ON the power

(1) Make sure that all bolts are tightened securely

(2) Make sure that all connectors are connected securely

(3) Make sure that all hydraulic hoses and air pipes are connected securely.

(4) If the machine is equipped with any optional external equipment (bar feeder, loader, robot), make sure that each electrical cable and hydraulic/pneumatic pipes are connected correctly.

(5) Check the input voltage and all the L1/L2/L3 (R/S/T) phases of input power.

After Turning ON The Power After Installation:

(a) Never feed the axes right away after turning ON the power; manually operate the cycle pump to supply lubricating oil to the slideway surfaces first.

(b) Check for oil leaks. Make sure that all of the gauges indicate the correct values.

(c) Make sure that any transit clamps left in the machine are removed.

(d) Repeatedly open and close the chuck to break in the chuck operation cylinder. Then, break in the spindle.

1.2.3 Turning the Power On and Off

(1) Always check that there are no obstacles or people near the machine's movable parts before operating the machine.
(2) If the machine stops due to a power failure, turn the Main Disconnect Switch OFF immediately.
(3) The machine cannot operate unless the power is supplied correctly. A momentary power stoppage due to a power failure or lightning can cause an accident. Therefore, stop the machine of abnormal fluctuation of power supply due to lightning, etc. Is anticipated.
(4) Before starting machine operation, make sure that all of the gauges (hydraulic pressure, lubricating oil pressure, compressed air pressure, etc.) indicate the correct values. Air should always be supplied to a machine equipped with a parts catcher.
(5) After turning the power ON, make sure that the cycle pump and the fans are operating correctly.
(6) Never feed the axes right after turning the power ON; manually operate the cycle pump to supply lubricating oil to the slideway surfaces first. Also, break in the spindle for at least 15 minutes.
(7) To turn the power OFF, follow the sequence below:
-Press the Emergency Stop Button.
-Press the POWER OFF Switch on the operation panel.
-Turn the Main Disconnect Switch OFF.

1.2.4 Safety Practices during Setup and Operation

(1) Never touch any switch with wet hands.
(2) The machine should be operated by one, well-trained person only, at any time, injury can occur if more than one person operates the machine; the machine could be started by one operator while the other operator is changing the fixture or chuck jaws. If more than one operator is absolutely necessary, all involved operators must cooperate and be able to communicate.
(3) Always turn the power OFF before performing setup. If

setup must be performed with the power ON, set the switches on the operation panel to the following positions:

1) Mode Selector Switch.....Handle
2) Spindle speed range.....Natural
3) Chuck.....Unclamp
4) Spindle speed adjusting dial.....Lowest position
5) Turret index switch.....To the current turret position
6) Override switches.....Lowest position
7) Machine lock.....On

(4) When loosening the bolts on tool holders and cutting tools, or loosening the tailstock body clap bolts, be sure to loosen them gradually.

(5) When a manual chuck or manual fixture is used, always remove the clamp handle from the chuck or fixture after tightening.

(6) Specify a spindle speed which is permissible for the chuck, cylinder, and fixture. If this condition is not satisfied, the workpiece may come off the spindle, injuring operators and damaging the machine.

(7) Select the proper chucking pressure and tailstock spindle thrust pressure for the desired type of machining.

(8) Clamp the workpiece and cutting tools securely. Depth of cut and cutting feed must be selected beginning with small values.

(9) Carefully check the workpiece chucked conditions and the center pressing conditions for center work operations.

(10) Make sure that the tool holders, tools, soft jaws, and tailstock are all tightened securely. They should be mounted and well balanced so that they will not interfere with the workpiece or the machine.

(11) Be careful not to operate the wrong switch. Visually check the switches on the operation panel before operating them.

(12) The halogen lamp will be very hot after it gas been lit for a long period. Be careful not to touch it.

(13) Always lower the spindle speed when changing the spindle speed range while the spindle is rotating.

(14) While operate machine, do not touch or close to movement zone, turning or movable unit will cause

serious injury.

(15) Make sure that machine's left door is well closed, or do not turn the spindle.

(16) Do not insert bar stock into the spindle while the spindle is rotating.

(17) The length of bar stock should be shorter that spindle's length, or it will cause danger.

(18) Keep the front door closed while the machine is operating. The area inside the front door contains many sources of potential danger-the spindle rotation at a high speed with a workpiece clamped in it, the turret which rotates and moves in many directions with a number of sharp cutting tools, etc.

(19) Never try to open the front door while the spindle is rotating to remove chips or try to touch the workpiece or cutting tools.

(20) Never stand in front of the rotating unit, chuck, or the spindle. During setup, the workpiece, cutting tools, or chuck jaws might fly out.

(21) Never remove or open the covers unless absolutely necessary.

(22) Never start machine operation with the safety devices in place.

(23) Cover your hair and do not wear loose clothing or jewelry to avoid becoming tangled or caught in the machine. Always wear proper shoes when operating the machine.

(24) Do not lean on the machine while the machine is operating. Leaning on the covers can be very dangerous.

(25) Specify a spindle speed which is permissible for the chuck, cylinder, and fixture. If this condition is not satisfied, the workpiece may come off the spindle, injuring operators and damaging the machine.

(26) After the completion of a cycle, before removing a machined workpiece and setting a new workpiece, always check that the Cycle Start Indicator is not lit and that the Feed Hold Indicator is lit.

(27) Carefully check the workpiece chucked conditions and the center pressing conditions for center work operations.

(28) Clamp the workpiece and cutting tools securely. Depth of cut and cutting feed must be selected with small valued.
(29) During center pressing operation, always set the tailstock spindle interlock to the ON position so that the cycle will not start until the workpiece is held by the tailstock spindle center.
(30) Always use straight bar stocks. When bar stock is machined using a bar feeder, the bend of the bar stock will cause vibration which, in turn, will deteriorate the accuracy of the finished workpiece.
(31) When machining bar stock longer than the spindle length, always use a bar feeder.
(32) Before pressing the Cycle Start Switch to begin automatic operation, make sure that the Dry Run Switch is set in the OFF position and that all other switches, such as the Spindle Override Switch and the Feedrate Override Switch, are set to the proper position.
(33) When running a new program for the first time, check the program number. Never attempt to start a new program in the automatic made; carefully run the program one block at a time using the single block function.
(34) During automatic mode operation, be careful not to touch any switches inadvertently.
(35) Before starting or stopping the spindle, set the spindle speed adjusting dial (spindle speed override dial on operation panel) to the lowest setting.
(36) Always lower the spindle speed when changing the spindle speed range while the spindle is rotating.
(37) If an hard over travel alarm occurs, the axis interlock must be released to move the axis. In this case, never move the axis in opposite direction.
(38) Never put any tools or instruments on the machine operation panel or on any machine part.
(39) A machine with special specifications, must be operated in accordance with the specification.

1.2.5 Safety Practices during Maintenance and Inspection

Always turn OFF the power before performing maintenance and inspection. Maintenance and inspection inside the cover is especially dangerous.

(1) Daily Maintenance:

In order to ensure safe operations, the machine must be maintained and inspected daily.

1) Clean the machine so that any abnormalities can be found easily.
2) During dry cutting or when machining cast-iron workpieces, carefully remove chips from the machine not to accumulate them.
3) Make sure that the gauges for hydraulic pressure, air pressure, and lubricating oil pressure indicate the correct values.
4) Make sure that lubricating oil is properly supplied to the slideways.
5) Drain the air regulator (for machines equipped with FRL unit).

(2) Precautions on Performing Maintenance and Inspection:

1) Wiring work for 200V AC or higher voltage circuits must be performed only by an authorized electrical technician.
2) Never change the parameter settings without consulting your Leadwell representative. If changed inadvertently, some parameters will cancel interlock settings.
3) Do not climb on the machine unless absolutely necessary.
4) When chips are being discharged with the chip conveyor, never put your hand or foot on the conveyor.
5) The drain, provided in the spindle front cover to keep coolant from entering the spindle bearings, must be kept clean and unblocked by foreign matter.
6) When a hollow chuck is used, a coolant drain is provided at the cylinder portion at the rear of the spindle. This drain must also be kept clean and unblocked by foreign matter.

7) Disassemble and clean the chuck periodically. Apply grease to the chuck every day.
8) The solenoid valves become very hot when the machine is operating. Be very carefully not to touch them after the power in turned OFF.
9) Supply or change hydraulic oil or lubricating oil as specified in the Instruction Manual.
10) Use only fresh, uncontaminated lubricating oil as specified in the Instruction manual. Clean the reservoirs and filers in the lubrication line periodically and check for damages to the lubrication equipment and piping.
11) The fan and filers in the electrical cabinet must be kept clean.
12) Do not open the doors of the electrical cabinet, the NC unit, or the operation panel unless absolutely necessary. Opening the doors allows dust, foreign matter, and moisture to enter the enclosure and can cause machine malfunctions.
13) Before changing the battery for memory back up, make sure that the power in turned ON. If the battery is changed with power OFF, all programs, parameters, and other data stored in memory will be lost.
14) The halogen lamp will be very for after it has been lit for a long period. Be careful not to touch it.
15) Carry out daily, monthly, and semi-annual inspection as specified in the Instruction Manual.

1.2.6 To Ensure High Accuracy

When operating a CNC lathe, the accuracy of the finished product cannot be maintained unless the following check points are observed. Failure to observe these check points can also cause to accidents.

Check Points:

(1) Allow a sufficient clamping area so that the workpiece will not come out of the chuck due to the cutting fore of centrifugal force generated by spindle rotation. Depending on the shape of the workpiece, it may need to

be supported by the tailstock.

(2) When chucking a workpiece, determine the chucking method and chuck pressure considering the rigidity of the workpiece so that the workpiece will not be distorted by the chuck.

(3) Machine vibration will result when workpiece with its center of gravity not at the chuck rotating center is rotated in the chuck. This, in turn, will deteriorate the accuracy of the machined workpiece.

(4) Careless tooling will cause interference between the tools and the workpiece being cut or the tailstock. Check the tooling carefully to avoid interference.

(5) Before starting the day's operation, break in the spindle and the axes. This will minimize the influence of thermal distortion on workpiece accuracy.

(6) When bar stock is used, its bend has veridical influence on the accuracy of the machined workpiece. Use straight workpieces only.

(7) If any chips are entangled on the wlrkpiece or cutting tool, surface roughness will be deteriorated. Select a cutting tool which will not entangle chips.

(8) Workpiece materials and shapes will vary widely. It is necessary to select the cutting conditions best suited to each workpiece in order to obtain the required accuracy.

(9) When forged or cast workpiece are used, the cutting allowance varies greatly from the finished dimensions. To avoid this variation, either write a program in which takes the variation into consideration or perform pre-machining so that a uniform cutting allowance is left on the workpiece.

1.2.7 Precautions when Selecting coolant

There are a variety of types of coolant available on the market. We do not specify the type of coolant to be used. Choose a coolant suitable for the user's applications by consulting the supplier, taking the following requirements into consideration.

(1) The coolant must be free of constituents with adverse

effects (smell, poisoning, etc.) on human beings.
(2) The coolant must not deteriorate during storage.
(3) The coolant must not cause corrosion of the machine.
(4) The coolant must not peel the coating off the machine.
(5) The coolant must not cause swelling of rubber parts.
(6) The coolant must not cause deterioration of accuracy.

※Note:Leadwell cannot be held responsible for any trouble arising from the use of coolant.

1.2.8 Precautions When Operating Special Specification Machines

(1) Industrial robot specification:
Only properly authorized persons trained and approved in accordance with local regulations may operate the robots. Unauthorized persons may not operate the robots for any reason, including teaching and inspection. Anyone working with the robot operators must also be properly authorized.

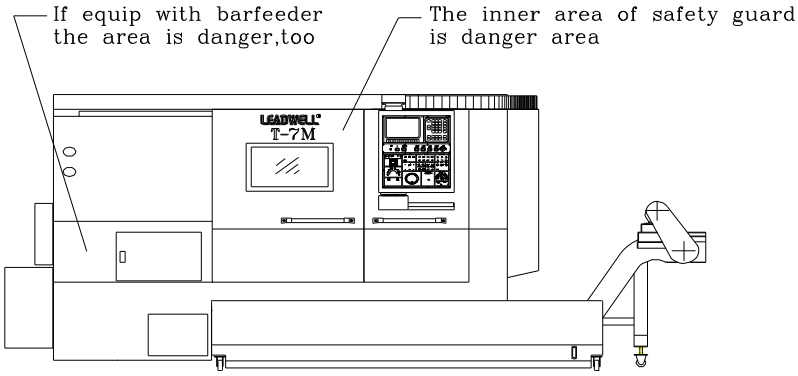
1.2.9 From Cover Window Glass

The front cover window glass will not break when hitting by chips generated during machining. However, there are instance (due to improper operation) when this glass has been broken by a workpiece, soft jaws, or a fixture. In such cases, the customer will be charged for replacing the broken glass.

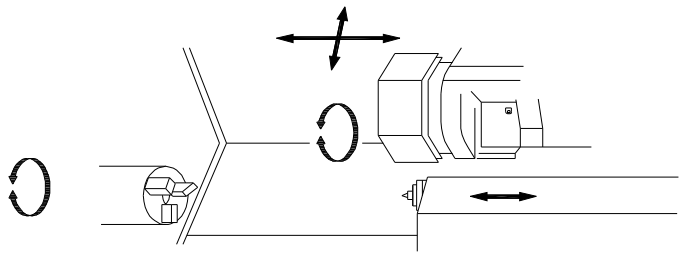
1.3 Machine Potential Danger Explanation

1.3.1 Machine Potential Danger Zone

During machine automatically cutting, inside of the machine is a very dangerous zone. It's because there is high rotating speed spindle. X and Z axis moving rapidly, tool magazine rotating to change tools, tailstock quill movement and the coolant continually spraying to working zone. These potential dangerous zone are all protected by safety cover to avoid people touching directly the moving parts. The positions marked by⇦⇨ of the following drawing are all high moving parts, the people operating or maintaining must be very careful to operate in the moving area.



The danger is caused by the parts with move or rotate



1)When the spindle is rotating or during automatic machine, you must not open any protective cover or door

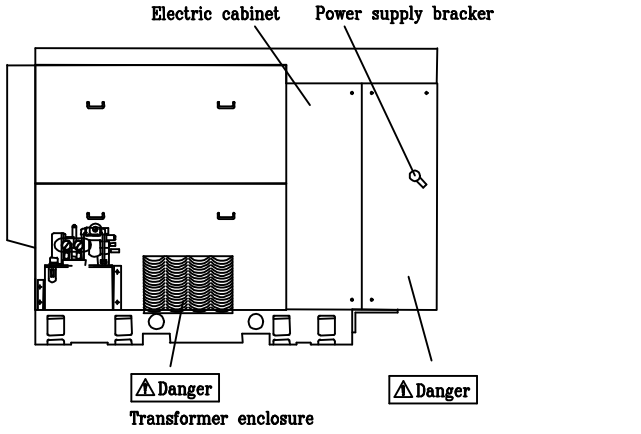
2)When power is on, if entering into a danger zone is necessary to do setting or maintenance, endure needs to be very carefully.

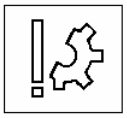
WARNING

※Ignoring WARNING this instruction will cause serious injury or machine damage.

1.3.2 High Voltage Danger Zone

Except electric cabinet, those stickers with mark ⚠ of also with high-voltage power, please do not open it or get close to these zones.





※ Only qualified electric engineer is allowed to open electric cabinet and Protective cover.

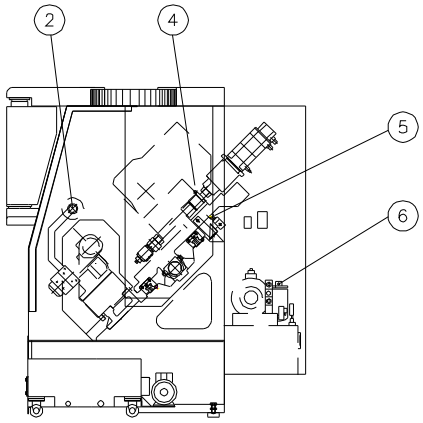
※ Never allow unqualified people enter any high-voltage zone.

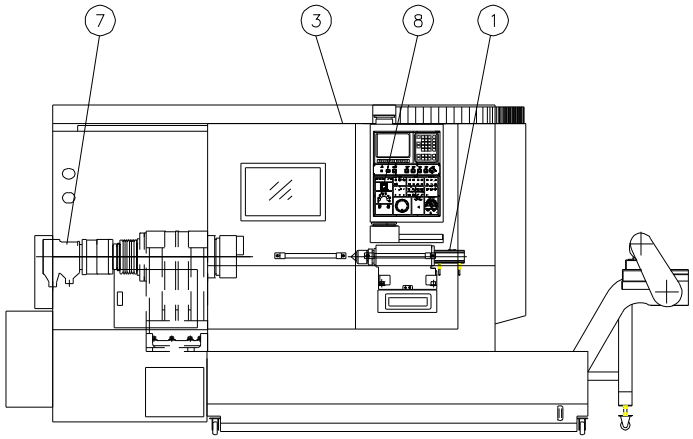
※ People who ignore ⚠ WARNING may result in death.

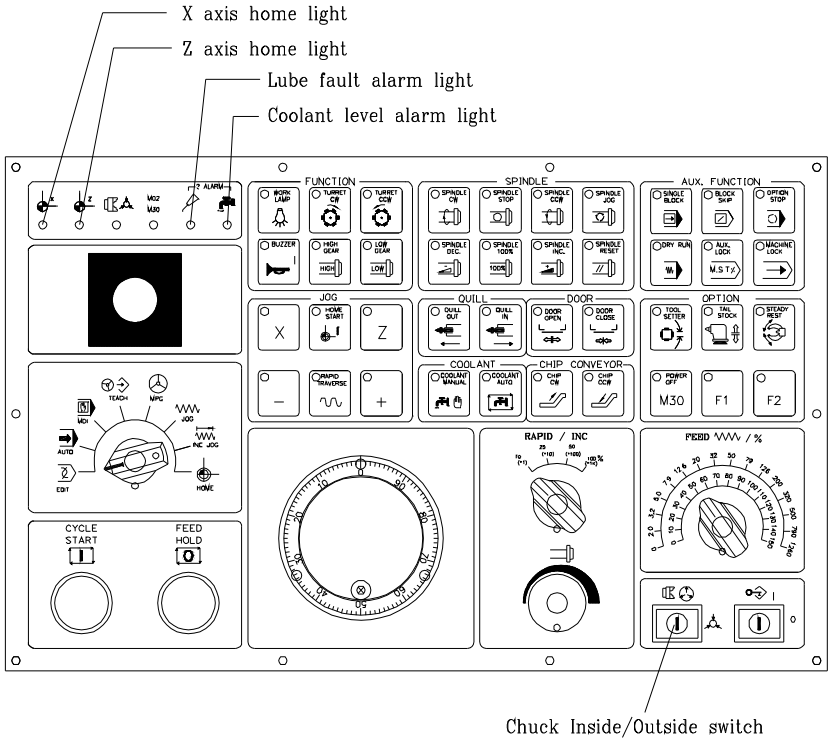
1.4 Safety Device Location

There are many safety device on this machine in order to protect operators from injury or machine damage. However the operators need to check to make sure these devices function normally before operating the machine.

No.	Description	No.	Description
1	Tailstock detect sensor	2	Tool arm detect sensor
3	Front door sensor	4	X axis limit switch
5	Z axis limit switch	6	Hydraulic pressure sw.
7	Chuck sensor	8	Emergency stop push bottom







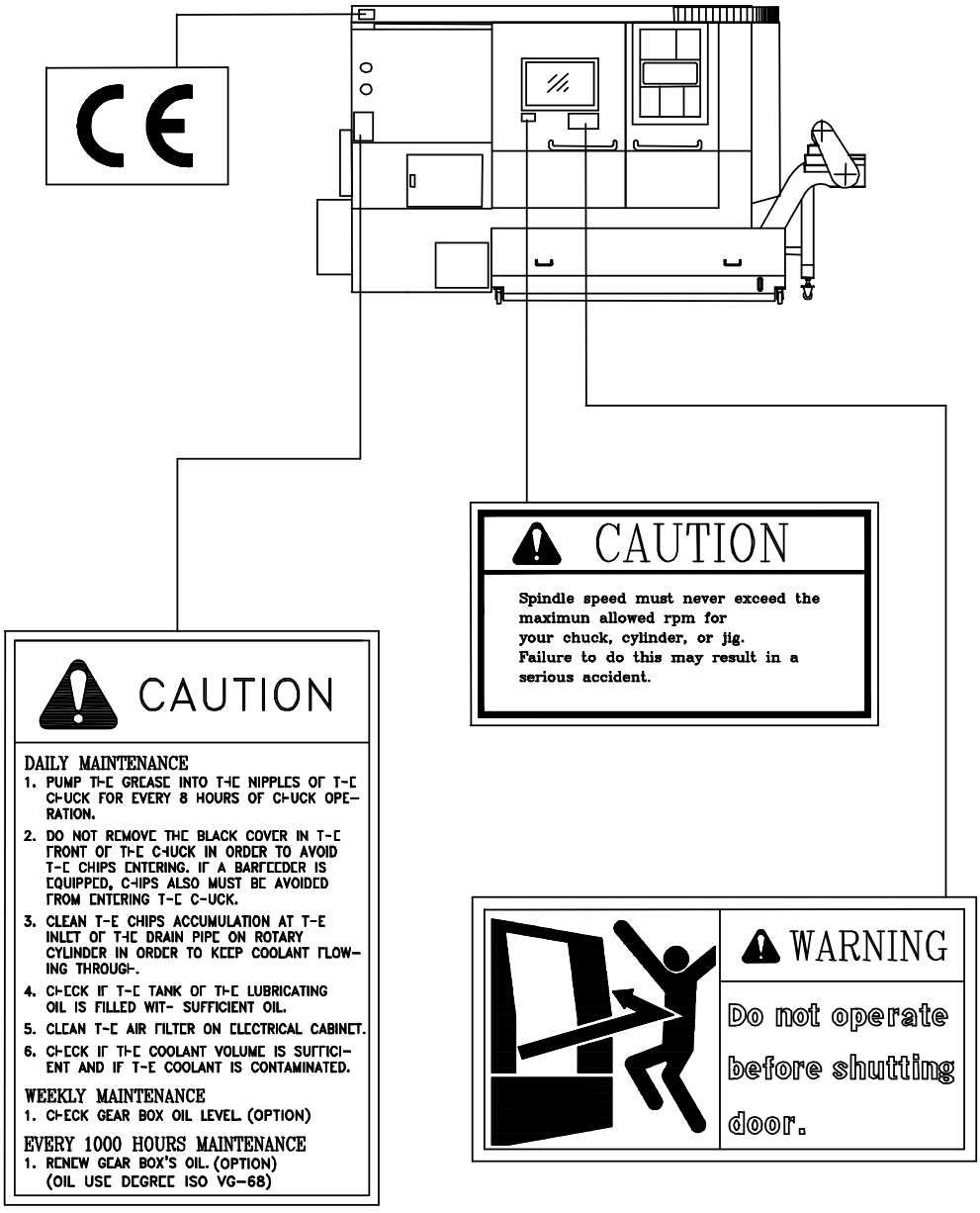
DANGER

1) It is not allowed to remove or change the safety devices without the our permission.
2) Only qualified electric engineer is allowed to open electric cabinet and protective cover.

WARNING

Before any operation, make sure all the safety devices are under effective conditions. Contact with local agent in case of abnormal condition.

1.5 Caution Label On the Machine


CE
CAUTION
Spindle speed must never exceed the maximun allowed rpm for your chuck, cylinder, or jig. Failure to do this may result in a serious accident.
CAUTION
DAILY MAINTENANCE
1. PUMP TH-E GREASE INTO TH-E NIPPLES OF T-E CH-UCK FOR EVERY 8 HOURS OF CH-UCK OPE-RATION.
2. DO NOT REMOVE THE BLACK COVER IN T-E FRONT OF TH-E C-UCK IN ORDER TO AVOID T-E CHIPS ENTERING. IF A BARFEEDER IS EQUIPPED, C-IPS ALSO MUST BE AVOIDED FROM ENTERING T-E C-UCK.
3. CLEAN T-E CHIPS ACCUMULATION AT T-E INLET OF T-E DRAIN PIPE ON ROTARY CYLINDER IN ORDER TO KEEP COOLANT FLOW-ING THROUGH.
4. CH-ECK IF T-E TANK OF TH-E LUBRICATING OIL IS FILLED WIT- SUFFICIENT OIL.
5. CLEAN T-E AIR FILTER ON ELECTRICAL CABINET.
6. CH-ECK IF TH-E COOLANT VOLUME IS SUFFICI-ENT AND IF T-E COOLANT IS CONTAMINATED.
WEEKLY MAINTENANCE
1. CH-ECK GEAR BOX OIL LEVEL. (OPTION)
EVERY 1000 HOURS MAINTENANCE
1. RENEW GEAR BOX'S OIL. (OPTION)
(OIL USE DEGREE ISO VG-68)
WARNING
Do not operate before shutting door.

OIL USAGE RECOMMEND

ITEM \ BRAND	MOBIL	SHELL	ESSO	CASTROL
LUBRICATOR OF PNEUMATIC	DTE LIGHT	TURBO T32	TERESSO 32 NUTO H32	HYSPIN VG32 PERFECTO T32
AUTO LUBRICATOR SYSTEM	VACTRA 2	TONNA T68	FEBIS K68	MAGNA BD68
SPINDLE OIL COOLER SYSTEM	DTE LIGHT	TURBO T32	TERESSO 32 NUTO H32	HYSPIN VG32 PERFECTO T32
HYDRAULIC SYSTEM	DTE 24	TELLUS 37	UNIVIS N32 NUTO H32	HYSPIN AWS32
GEAR OF ROTARY TABLE	MOBILGARD 629	OMALA 150	SPARTAN EP150	ALPHA SP150
SPINDLE MOTOR GEAR BOX	DTE HEAVY MEDIUM	TURBO T68	TERESSO 68	ALPHA SP68

SAFETY INSTRUCTIONS

1.Read and understand LEADWELL Operator's Manual and all warnings on the sign before operating.
Failure to follow these instructions and warnings can result in serious injury or death.

2.This machine starts and moves automatically.
Never place any part of your body near or on moving parts of this machine.

3.Always stop the spindle compeletly before touching the workpiece,tool or spindle.

4.Do not operate this machine unless all guards, interlocks and other safety devices are in place and functioning.

5.Always clamp workpiece and cutting tool securely.
avoid excessive feeds and spindle speeds.

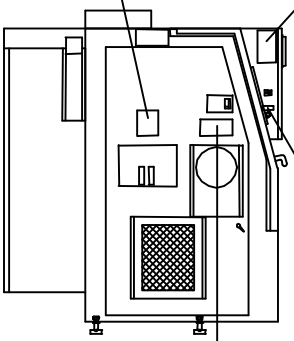
6.Remove rings, watches, jewelry and loose fitting clothing.
keep your hair away from moving parts of the machine.

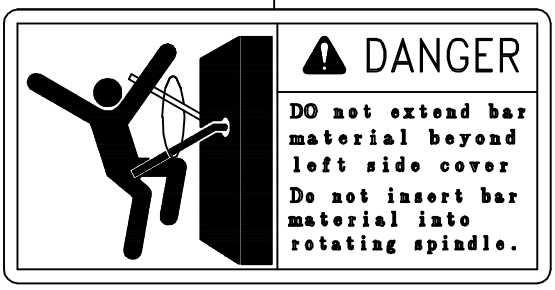
7.Always wear safety glasses, safety shoes and hearing protection when operating this machine.

8.Service or installation of this machine must be performed by qualified personnel only, following procedures described in the LEADWELL Maintenance Manual. Turn off and lock out power at main electrical panel before servicing.

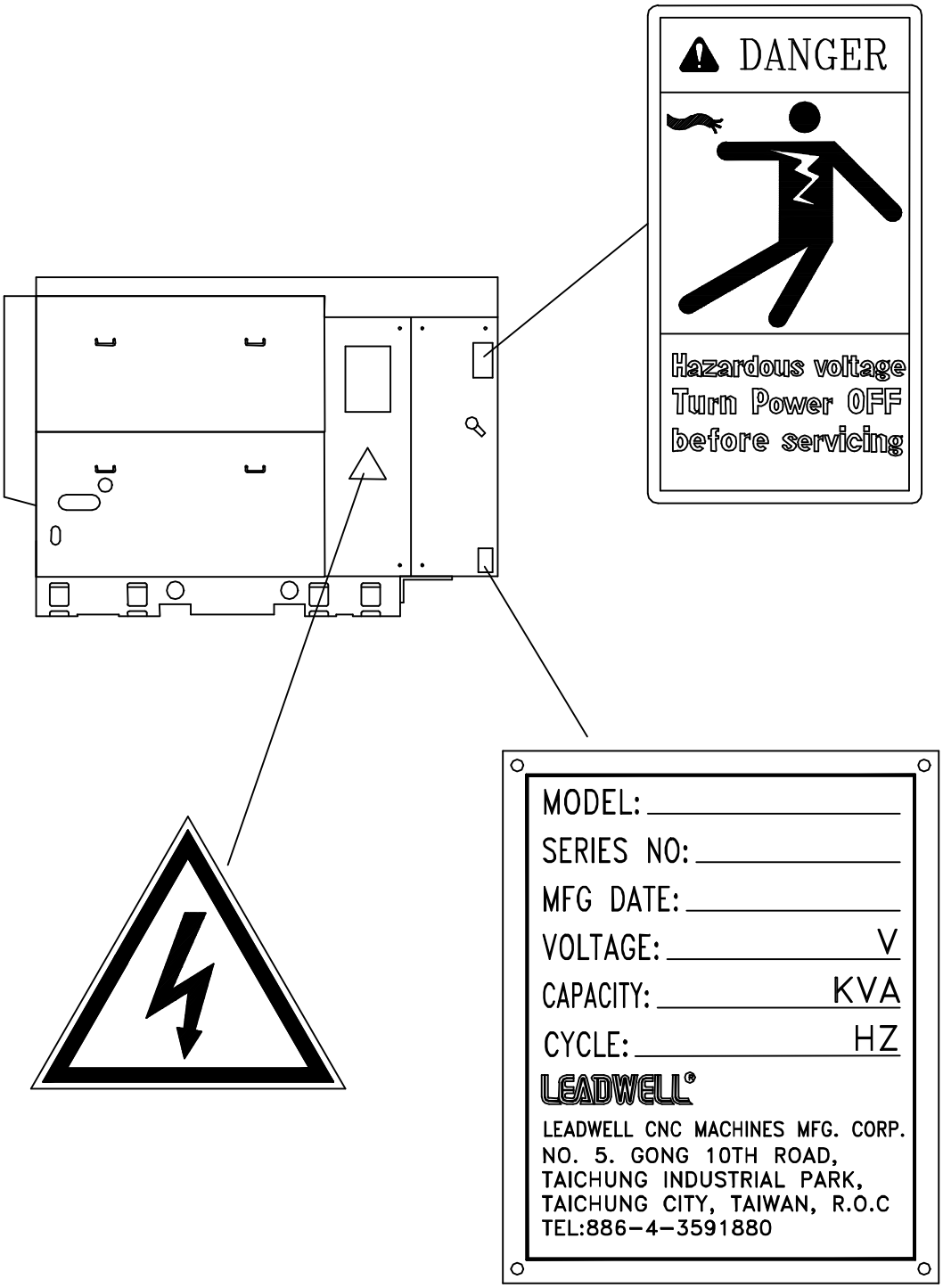
It is the responsibility of the user to be sure that this machine is in safe operating condition at all time and that the operator follows the safe operating procedures described in the LEADWELL Operator and Maintenance Manuals and all signs attached to this machine.If you have any questions concerning the safe operation of this machine, contact your supervisor or local LEADWELL Distributor.

Please do not remove or disfigure this sign.





EMERGENCY
OVER TRAVEL RELEASE


DANGER
Hazardous voltage
Turn Power OFF
before servicing
MODEL:
SERIES NO:
MFG DATE:
VOLTAGE: V
CAPACITY: KVA
CYCLE: HZ
LEADWELL®
LEADWELL CNC MACHINES MFG. CORP.
NO. 5. GONG 10TH ROAD,
TAICHUNG INDUSTRIAL PARK,
TAICHUNG CITY, TAIWAN, R.O.C
TEL:886-4-3591880

Machine
Brief Introduction

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2.1 Machine Introduction & Noise Level

2.1.1 Machine Introduction:

The CNC Lathe has been developed by Leadwell CNC machine company's many years efforts. It can work on turning metal workpiece like cast iron, steel, aluminum, copper, stainless steel and alloy steel. As for other material application, endures should contact first with material supplier for relevant safety information for application. But it's not suitable for the work to produce dust, corrosive liquid, and gas after cutting, if it's required indeed, make sure to contact Leadwell to help you to improve, don't determine by yourself to cause people's death and environment hurt.

This machine's main parts are spindle, spindle headstock, base, saddle, turret, tailstock, guarding, X axis drive, Z axis drive, hydraulic lubricant, coolant, chip conveyor, chip bucket, safe cover, and CNC controller, they are all protected by hermetical cover to protect the operator's safety, but when technician of maintenance take apart the guarding in order to repair machine, technician must pay attention for safety at all time. The machine gas been protected by software and mechanical devices in order to protect the operator's safety and keep machine's normal operation.

About the machine turret, your can set different tools according to what you need, and change tools by rotating way to make cutting. In parts clipping, the main way is hydraulic chuck, and tailstock center helps to clipping chuck, you can remove chuck to refit panel or do two centers work if it's necessary. When you do two centers work, please notice not to cut from spindle to tailstock, because tailstock centers are clipped by chuck, if hydraulic is not equal to cutting, the parts will be back to change clipping situation, and it will effect on parts accuracy.

The CNC Lathe is a kind of machine with servo controller, and it can automatically work after all things are ready for working; it doesn’t only raise efficiency but the operators’ safety, but it doesn’t mean there is no danger absolutely, so when you operate this machine, make sure to read the manual and all kinds of instruction manual to understand all correct operating ways for the program and parameter function, before automatic cutting operated by program, please confirm the program is right and notice all warn signs and messages at the same time, remember not to operate illegally.

Next, this machine can be retrofitted with options like chip conveyor, barfeeder, parts catcher, skimmer, oil-mist collector, tool setter, automatic door, spindle air blast, and gantry robot. Furthermore the spindle drive can be changed from V-belt drive to H.T.D. belt drive. The type of NC controller can be specified by customer, but we would recommend to equip with Fanuc or Mitsubishi controllers. It can design special chuck according to the customers’ requirements, so the customers can consider that this machine can extra fit or refit many functions in the safe working range with enough space.

2.1.2 Noise Level

The method to test the noise level is to measure the noise by a distance of 1 meter from machine guarding and height 1.6 meters from ground. Please refer to following chart and layout.

Airborne noise test report

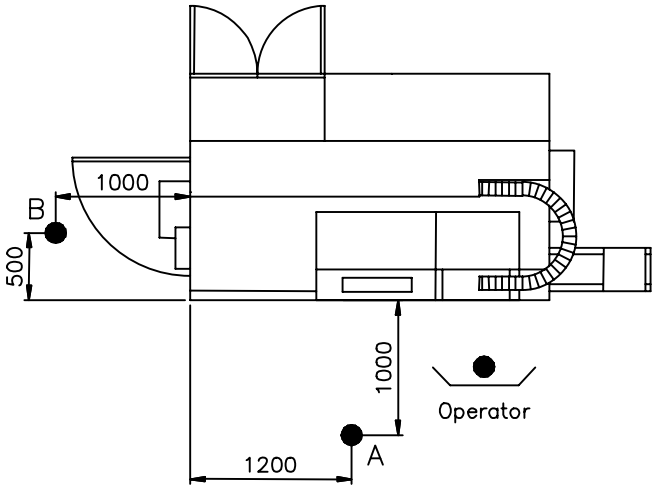
Date : 12/17/2003
Machine type : T-7M
Instrument : PULSAR 83P series

* Environment noise: 69dBA

Without cutting load	A position	B position
1000(rpm)	71	72
2000(rpm)	72	72
3500(rpm)	73	74
Cutting load	A position	B position
800(rpm)	83	84

unit: dBA

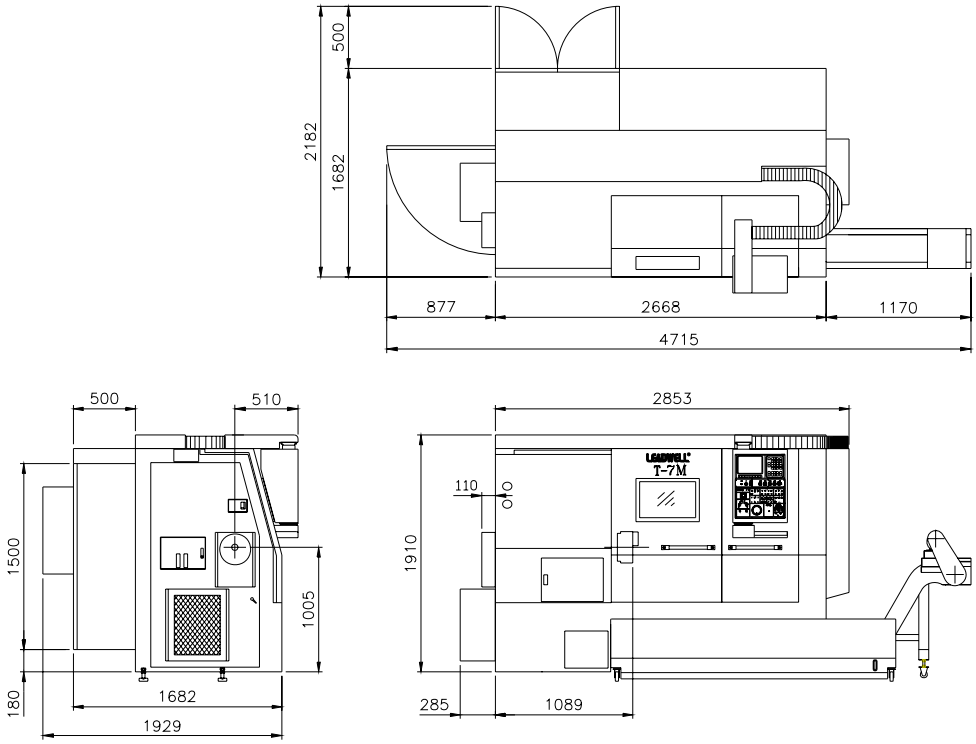
Cutting condition: 100% rating horsepower
f=0.4, t =7mm, D= φ 75mm, L=250mm
Material : middle carbon steel



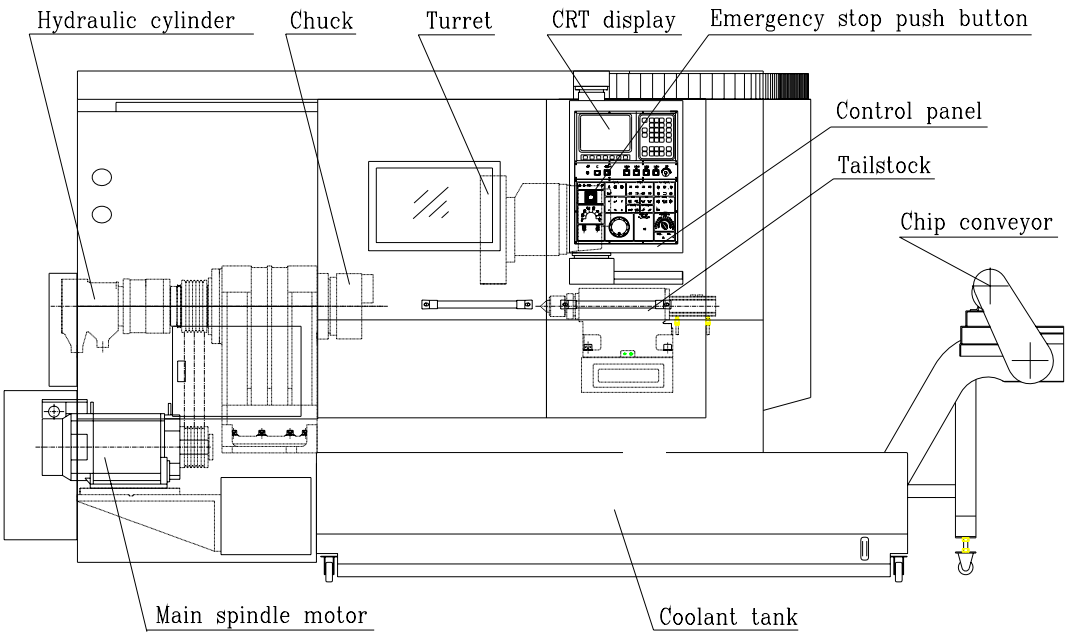
No vibration effect to the operator ＊

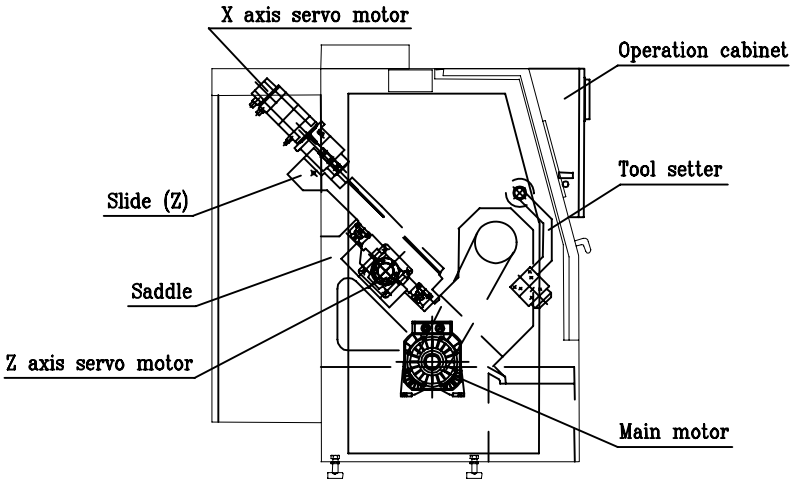
2.2 Machine Outline Dimension & Nomenclature

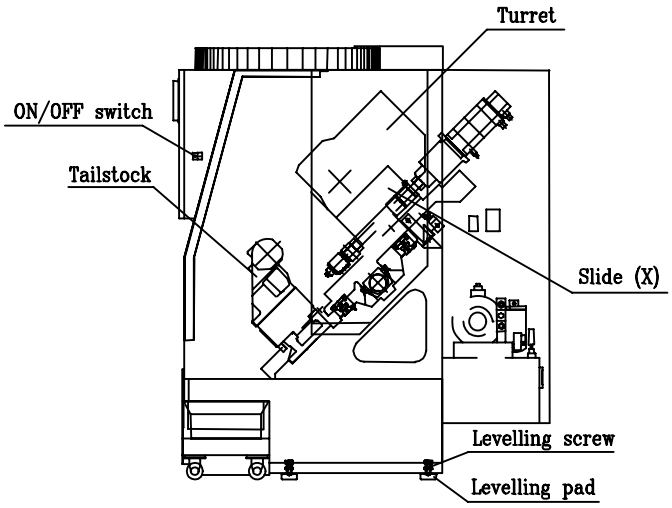
2.2.1 Machine Outline Dimension

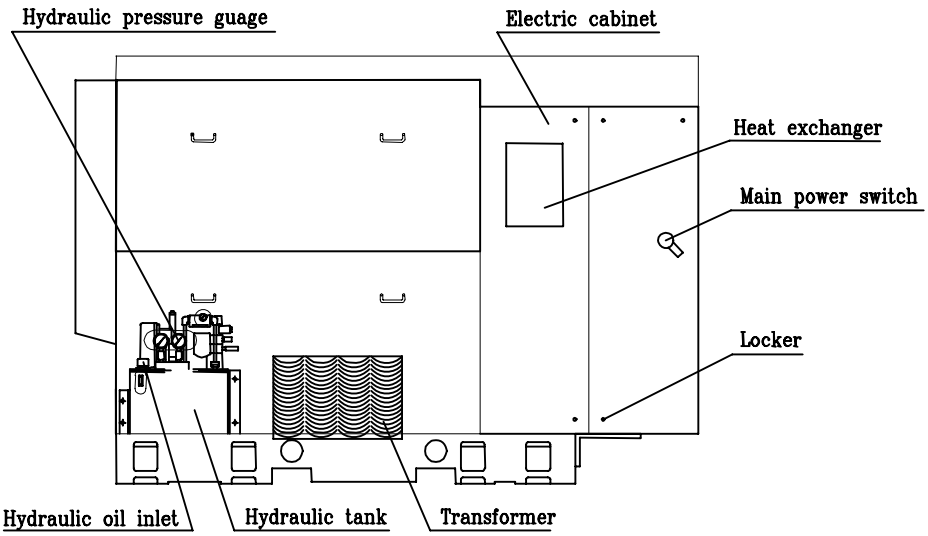


2.2.2 Nomenclature



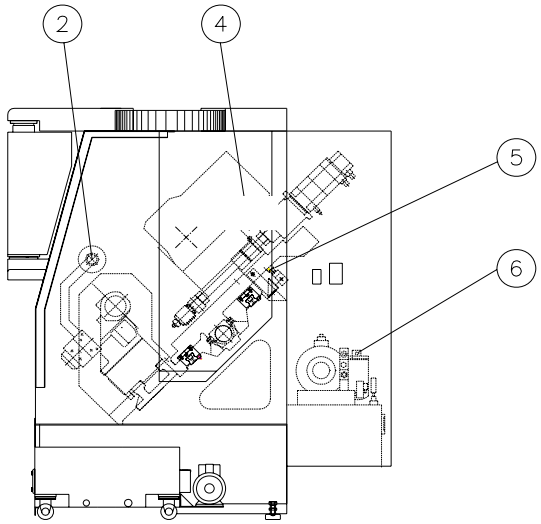

X axis servo motor
Operation cabinet
Tool setter
Slide (Z)
Saddle
Z axis servo motor
Main motor

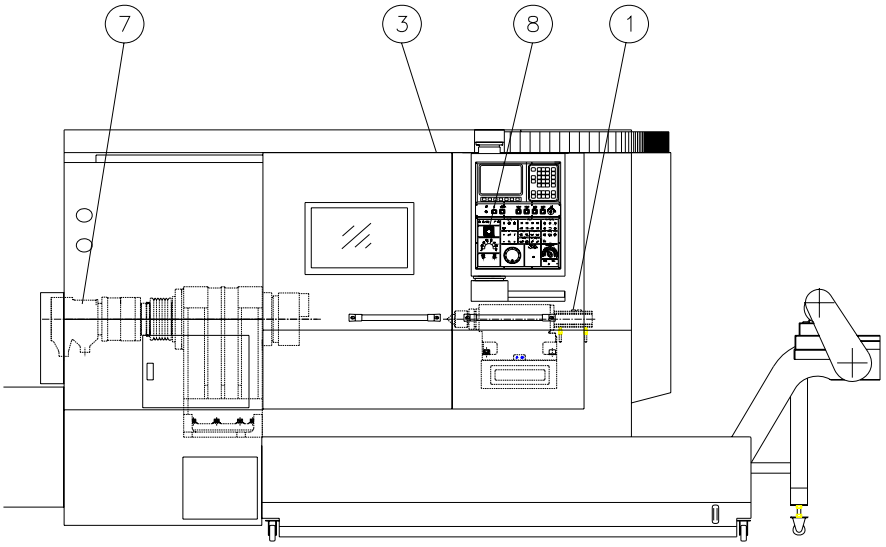

Turret
ON/OFF switch
Tailstock
Slide (X)
Levelling screw
Levelling pad


Hydraulic pressure guage
Electric cabinet
Heat exchanger
Main power switch
Locker
Hydraulic oil inlet
Hydraulic tank
Transformer

2.2.3 Sensor/Limit switch Location:

No.	Description	No.	Description
1	Tailstock detect sensor	2	Tool arm detect sensor
3	Front door sensor	4	X axis limit switch
5	Z axis limit switch	6	Hydraulic pressure sw.
7	Chuck sensor	8	Emergency stop push bottom

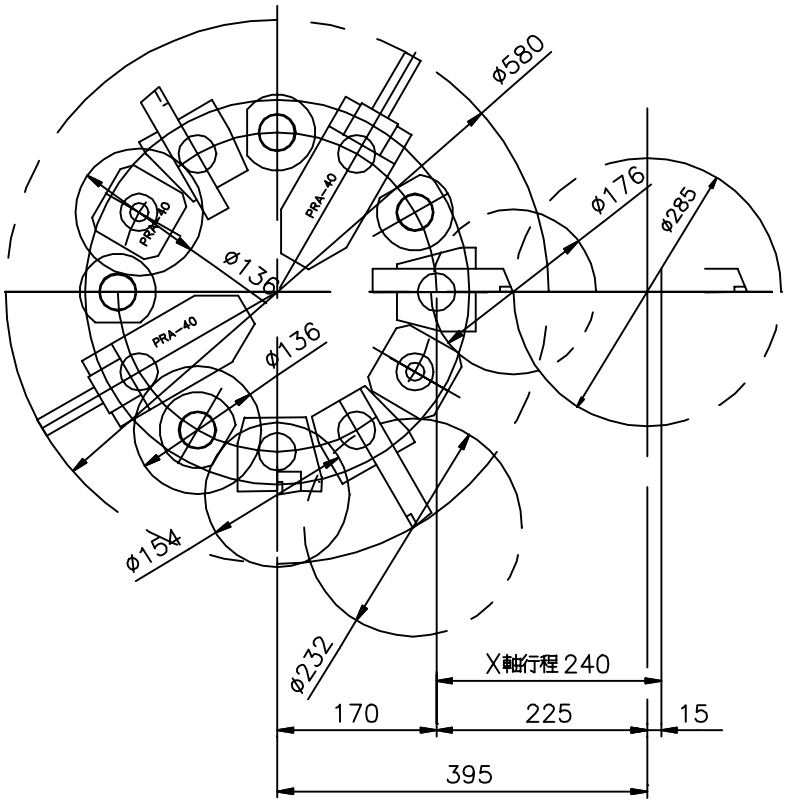




2.3 Working Range

2.3.1 Tool Capacity

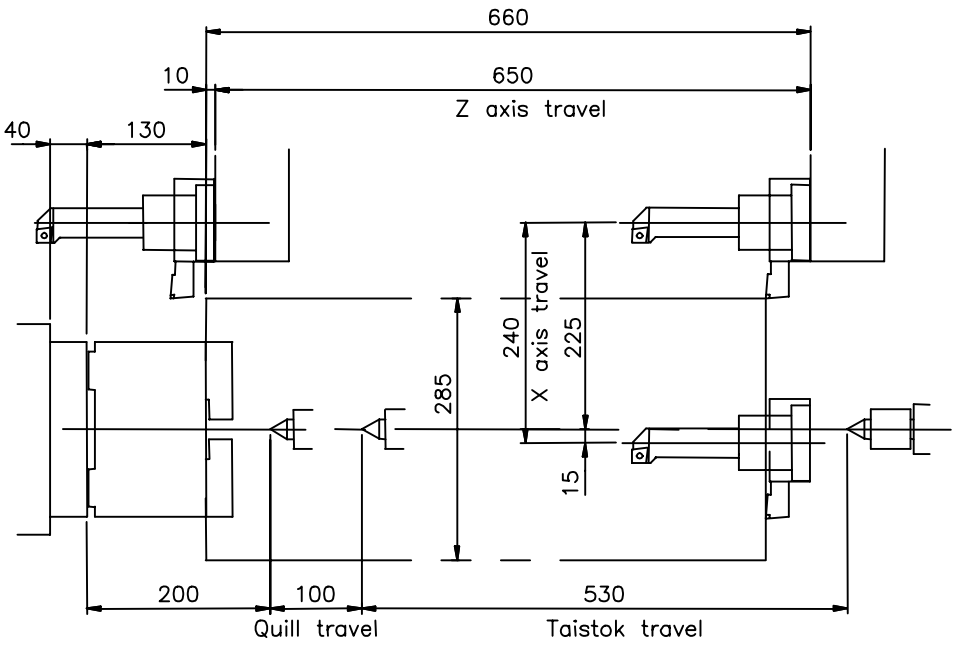
T-7M



If the O.D. tool shank is □25mm(1”)＊150mm(6”) long, then the maximum turning diameter is § 285mm(11.22”). If there is adjacent boring bar holder, then the maximum turning diameter is § 136mm(5.35”); if the I.D. tool shank have adjacent boring bar holder, then the maximum turning diameter can achieve § 154(6.06”); if the boring bar tool shank have adjacent boring bar holder, then the masimum turning diameter can achieve § 176mm(6.93”).

2.3.2 Tool Travel

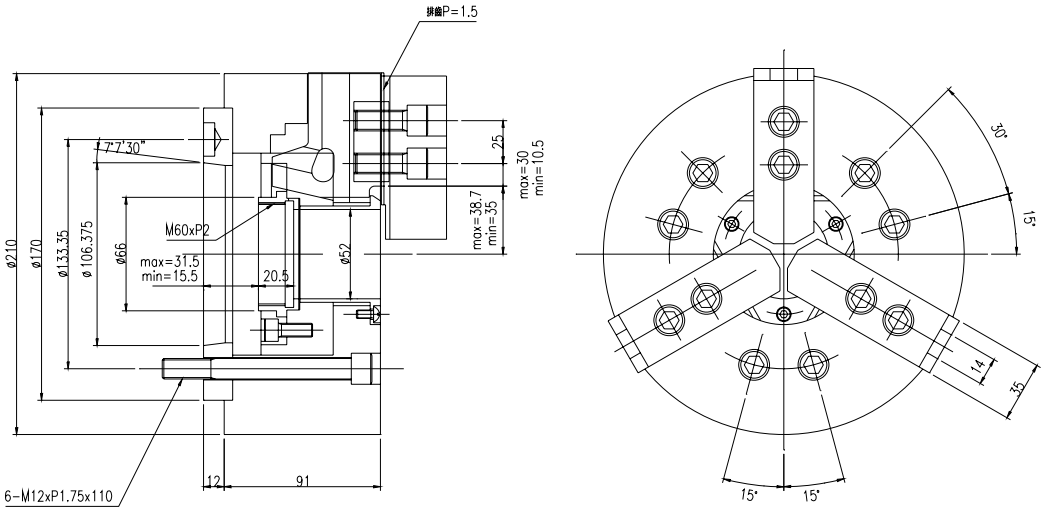
T-7M



Maybe the boring bar tool extends 70mm over the turret, when you use boring bar tool, Z axis travel should reduce about 70mm relatively.

2.3.3 Clamping Range

The chuck specification is Ton Fou TF3B-8A6 model as below.

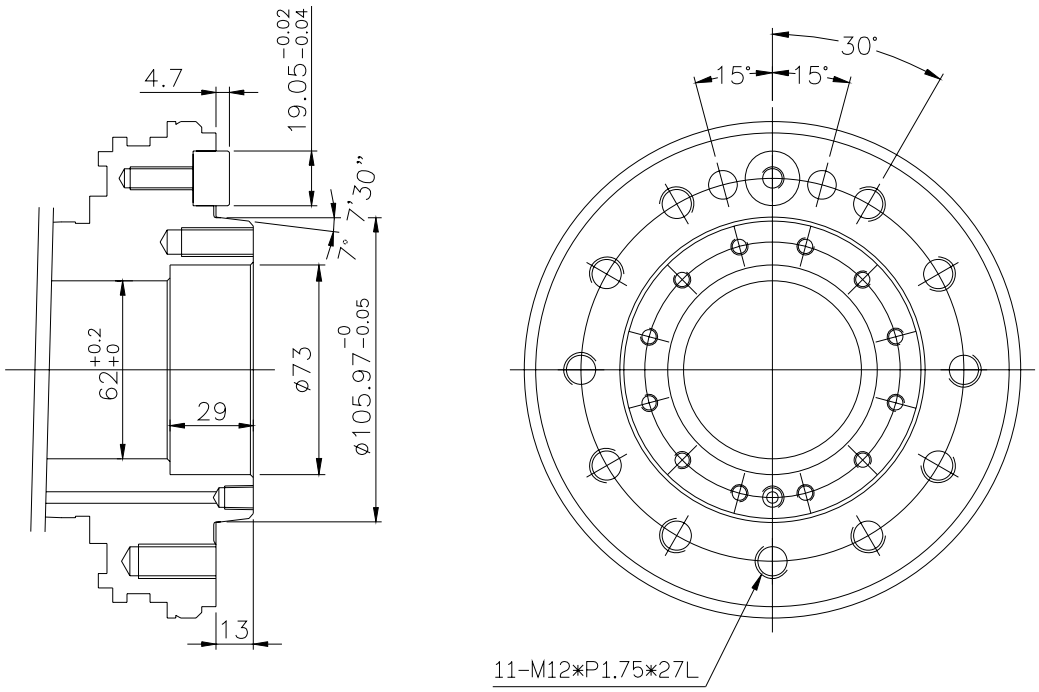


✱If the end user wants to change type of hydraulic chuck, end user should contact with Leadwell to make sure of safety.

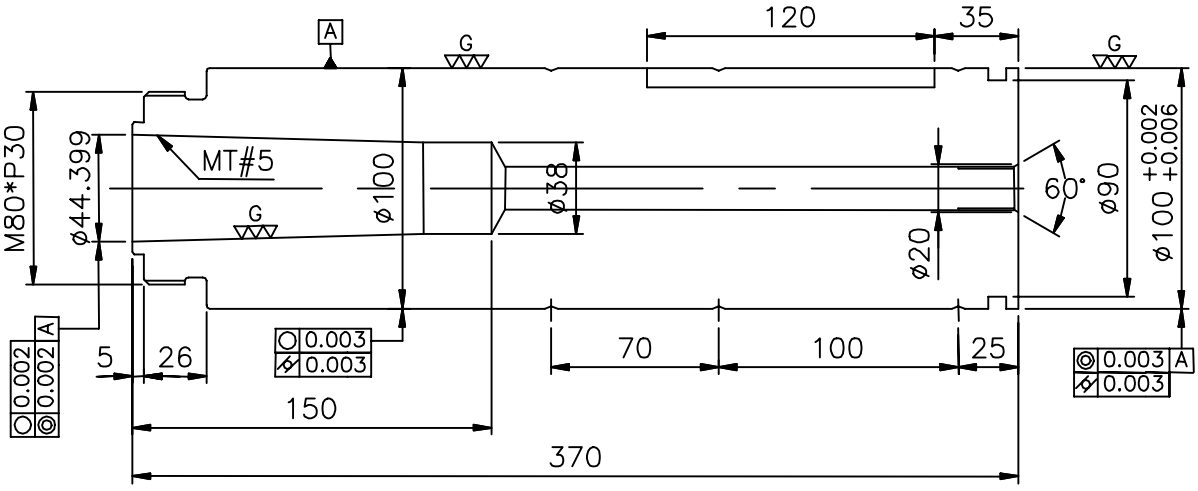
2.3.4 Spindle Nose End & Tailstock Taper Dimension

(1) Spindle Nose Ens.

The spindle nose specification comply to ISO 702/1 (8) standard.



(2) Tailstock Taper Dimension.



2.4 Machine Specification

2.4.1 Machine Hardware Specification

項　　目　/　SPECIFICATIONS			規　　格	
加工範圍	Capacity		O.P.T	S.T.D
.最大旋徑	Max. swing	mm(in)	φ637(25.0”)	
.滑板上旋徑	Swing over cross slide	mm(in)	φ440(17.3”)	
.最大加工直徑	Max. turning diameter	mm(in)	φ285(11.2”)	
.最大加工長度	Max. turning length	mm(in)	585(23”)	
.棒材最大徑	Bar capacity	mm(in)	φ51(2”)	φ65(2.5”)
.最大工件重量	Max. workpiece weight (withtailstock)	kg	175	
行　　程	Travel			
.X 軸	X axis	mm(in)	225+15(8.8”+1”)	
.Z 軸	Z axis	mm(in)	640(25.2”)	
.B 軸	B axis	mm(in)	---	
.X2 軸	X2 axis	mm(in)	---	
.Z2 軸	Z2 axis	mm(in)	---	
主　　軸	Spindle			
.主軸轉速	Spindle speed range	rpm	35-3500	
.夾頭尺寸	Chuck size	in	205(8”)	
.主軸鼻端	Type of spindle nose		A2-6	
.主軸孔徑	Through spindle hole diameter	mm(in)	φ62(2.4”)	φ76(2.9”)
.前端軸承內外徑	Front bearing I.D./O.D.	mm(in)	100/150(3.9”/5.9”)	
.後端軸承內外徑	Rear bearing I.D./O.D.	mm(in)	90/140(3.5”/5.5”)	
.主軸馬達型式	Spindle motor type	Siemens	1PH7137	
.主軸馬達出力	Spindle motor power	KW(HP)	22.5(30.2HP)	
.主軸最大扭力	Max. spindle torque	Kg-m	39	
.最大扭力轉速	Max. spindle speed torque	rpm	560	
.主軸最小分度增量值	Min. spindle indexing increment		±0.002°	
副 主 軸	Sub spindle			
.副主軸轉速	Sub spindle speed	rpm	---	
.副夾頭尺寸	Sub chuck size	mm(in)	---	
.副主軸鼻端	Sub spindle nose		---	
.副主軸軸承	Sub spindle bearing I.D./O.D.	mm(in)	---	
.副主軸馬達型式	Sub spindle motor type		---	
.副主軸馬達出力	Sub spindle motor power	KW(HP)	---	

●：標準配件　　■：標準選配(已設計)　　△：特殊選配(未設計)　　X：無此配件

項　　目　/　SPECIFICATIONS			規　　格
.副主軸最大扭力	Max. sub spindle torque	Kg-m	---
.副主軸快速位移	Sub spindle rapid traverse	mm/min	---
.副主軸伺服馬達	Sub spindle feed motor	Siemens /KW(HP)	---
.副主軸滾珠螺桿	Sub spindle ball screw		---
刀　塔	Turret		
.刀座數量	Number of tool stations		12
.外徑刀柄尺寸	Shank height for square tool	mm(in)	□25(1”)VDI $ 40
.搪孔刀柄尺寸	Shank diameter for boring bar	mm(in)	ϕ40(1.5”)VDI $ 40
.換刀時間(鄰刀)	Turret indexing time (adjacent tool) sec	sec	0.3
.換刀時間(對角)	Turret indexing time (180 deg) sec	sec	0.8
.動力刀座轉速:軸向	Rotary tool spindle speed range:axis units	rpm	3000
.動力刀座轉速:徑向	Rotary tool spindle speed range:radial units	rpm	3000
.動力刀座馬達型式	Rotary tool motor type	Siemens/rpm	1FT6086/4500
.動力刀座出力	Rotary tool motor power	KW(HP)	5.7(7.64HP)
進　給　率	Feedrate		
.X 軸快速位移	X axis rapid traverse	mm(in)/min	20000(787.4”)
.Z 軸快速位移	Z axis rapid traverse	mm(in)/min	24000(944.9”)
.B 軸快速位移	B axis rapid traverse	mm(in)/min	---
.每轉進給率	Feed per revolution	mm/rev	0.01-500
.寸動進給率	Jog feedrate	mm(in)/min	1260(49.6”)
精　　度	Accuracy		
.二軸定位精度	Positioning X,Z	mm	0.01/1000, 0.01/1000
.二軸重覆定位精度	Repeatability X,Z	mm	0.007/1000,0.007/1000
床　　身	Bed & Slide		
.Z 軸滑軌寬度	Overall bed guide width	mm(in)	441(17.4”)
.X 軸滑軌寬度	Cross slide guide width	mm(in)	258(10.1”)
.B 軸滑軌寬度	B axis guide width	mm(in)	---
.床身角度	Angle of bed	deg	45°
伺服馬達	Feed motors		
.X 軸馬達	X axis motor	Siemens /KW(HP)	1FK7083-5/3.3(4.42)
.X 軸馬達扭力	X axis motor rated torque at stall	kg-cm	107
.X 軸推力	X axis thrust force	Kg-f	537

●：標準配件　■：標準選配(已設計)　△：特殊選配(未設計)　X：無此配件

項　　目　/　SPECIFICATIONS			規　　格
.Z 軸馬達	Z axis motor	Siemens /KW(HP)	1FK7083-5/3.3(4.42)
.Z 軸馬達扭力	Z axis motor rated torque at stall	kg-cm	107
.Z 軸馬達推力	Z axis thrust force	Kg-f	537
.B 軸馬達	B axis motor	KW(HP)	---
.B 軸馬達扭力	B axis motor rated torque at stall	kg-cm	---
.B 軸推力	B axis thrust force	Kg-f	---
滾珠螺桿	**Ball screws**		
.X 軸	X axis dia. pitch	mm	φ32*P10*760L
.Z 軸	Z axis dia. pitch	mm	φ40*P12*1217L
.B 軸	B axis dia. pitch	mm	---
.U 軸	U axis dia. pitch	mm	---
.W 軸	W axis dia. pitch	mm	---
尾　座	**Tailstock**		
.尾座移動型式	Tailstock movement type		MANUAL
.尾座位移	Tailstock movement	mm(in)	520(20.4”)
.套管移動型式	Quill movement type		HYDRAULIC
.套管行程	Quill stroke	mm(in)	100(3.9”)
.套管直徑	Quill diameter	mm(in)	φ100(3.9”)
.套管錐度	Quill inside taper	M.T	5
.套管最大推力	Quill Max. thrust	Kg-f	600
油壓單元	**Hydraulic unit**		
.油壓泵動力	Pump motor	KW(HP)	1.5(2)
.油壓泵性能	Pump capacity	l/min	30
.油壓泵壓力	Pump pressure	kg/c ㎡	35
.油壓箱容量	Tank capacity	L	60
冷卻單元	**Coolant system**		
.水泵動力	Pump motor	KW(HP)	1.5(2)
.水泵性能	Pump capacity	l/min	30
.水泵壓力	Pump pressure	kg/c ㎡	35
.水箱容量	Tank capacity	L	60
集中潤滑單元	**Central lubrication**		
.油泵動力	Pump motor	KW(HP)	0.7(1)

●：標準配件　■：標準選配(已設計)　△：特殊選配(未設計)　X：無此配件

項　　目　/　SPECIFICATIONS			規　　格
.油泵性能	Pump capacity	1./min	65
.油泵壓力	Pump pressure	kg/c ㎡	2
.油箱容量	Tank capacity	L	100
其它項目	Miscellaneous		
.電力需求	Power supply	KVA	40
.機械總重	Mass of machine	kg	5000
.機械外觀尺寸(長)	Machine dimensions(L)	mm(in)	3138(123.5”)
.機械外觀尺寸(寬)	Machine dimensions(W)	mm(in)	1730(68.1”)
.機外外觀尺寸(高)	Machine dimensions(H)	mm(in)	1980(78.0”)

●：標準配件　　■：標準選配(已設計)　△：特殊選配(未設計)　　X：無此配件

2.4.2 Machine Software Specification

項　　目　/　SPECIFICATIONS		規　　格
機型特殊選擇性附件 / Special Option		
公制刀盤	Metric disc	●
英制刀盤	Inch disc	X
刀具偵測器	Tool setter	■
自動工件量測器	Automatic workpiece measurement	△
VDI 刀盤	VDI disc	●
手動尾座	Manual tailstock	●
可程式尾座	Program tailstock	■
手動中心架	Manual steady rest	△
油壓自動中心架	Hydraulic steady rest	△
接件器	Parts catcher	■
警示燈	Alarm lamp	■
警示蜂鳴器	Buzzer	●
電氣箱熱交換器	Heat exchanger	●
電氣箱冷卻機	Air conditioner	■
自動送料器	Bar feeder	■
機械手	Robot	△
自動門	Auto door	■
主軸外吹氣	Spindle air outer blow	■
主軸內吹氣	Spindle air inner blow	△
水高壓泵浦(4bar)	High pressure pump	■
排屑機	Chip conveyer	■
蓄屑車	Chip bucket	■
全密閉式護罩	Full enclosed splash guard	●
兩段變速箱	Two speed gearbox	■
三爪中空夾頭	3 jaw open center chuck	●
三爪中實夾頭	3 jaw close center chuck	△
筒式夾頭	Collect chuck	■
油霧收集器	Mist separator	■
油水分離機	Oil skimmer	■
FANUC 控制 (18T)	FANUC controller (18T)	■
FANUC 控制 (0i-TB)	FANUC controller (0i-TB)	●
α 15 主馬達	A 15 Spindle Motor	■
腳踏開關	Foot switch	●
H.T.D 皮帶	H.T.D belt	X
廣角 V 型皮帶	Wide angle V-Belt	●
溝槽皮帶	Micro V belt	X
變壓器	Transformer	■

●：標準配件　　■：標準選配(已設計)　　△：特殊選配(未設計)　　X：無此配件

項　　目　/　SPECIFICATIONS			規　　格
機型標準附件 / Standard			
夾頭	Chuck	1 set	L02AA00141
夾頭油壓缸	Chuck cylinder	1 set	L02ABTFRC8
軟爪	Soft jaw	3 set	L02AD0HC08
硬爪	Hard jaw	1 set	L02AD00412
調整水平治具	Leveling block	No. 4310395010	0
腳踏開關	Foot switch	No. G110SFS337	1
工具箱	Tool box	No. J15000TS1R	1
直型旋轉式車刀座	Rotating tool holder(Axial unit)	No.L02AEDA040	2
L 型旋轉式車刀座	Rotating tool holder(Radial unit)	No.L02AEDBR40	2

●：標準配件　　■：標準選配(已設計)　　△：特殊選配(未設計)　　X：無此配件

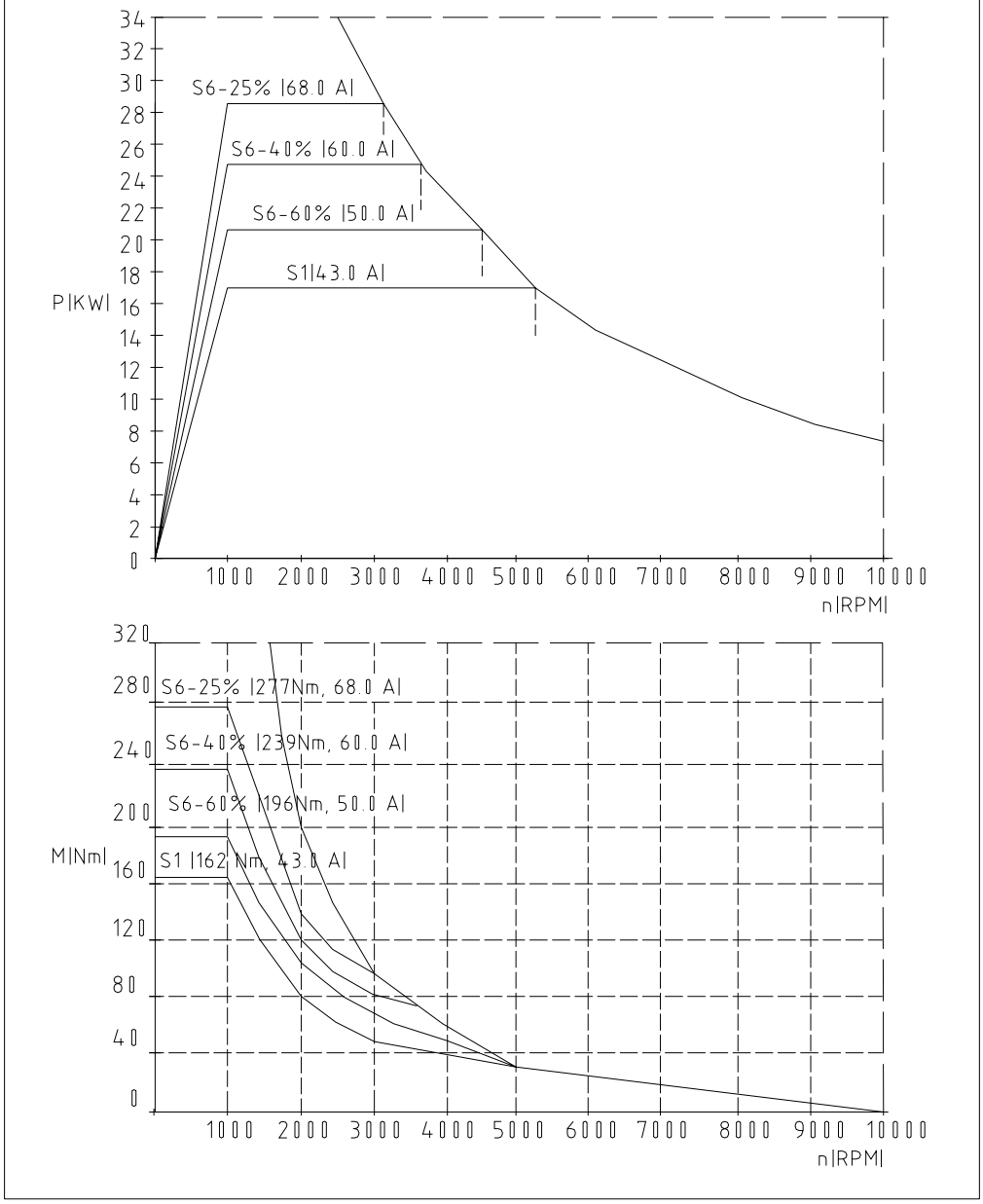
項　　目　/　SPECIFICATIONS			規　　格
機型選擇性附件 / Option			
切削輸送機	Chip conveyor	No. 4010019020	---
蓄屑推車	Bucket	No. 4020008000	---

●：標準配件　　■：標準選配(已設計)　　△：特殊選配(未設計)　　X：無此配件

2.4.3 Spindle Motor Torque Curve

1PH7137

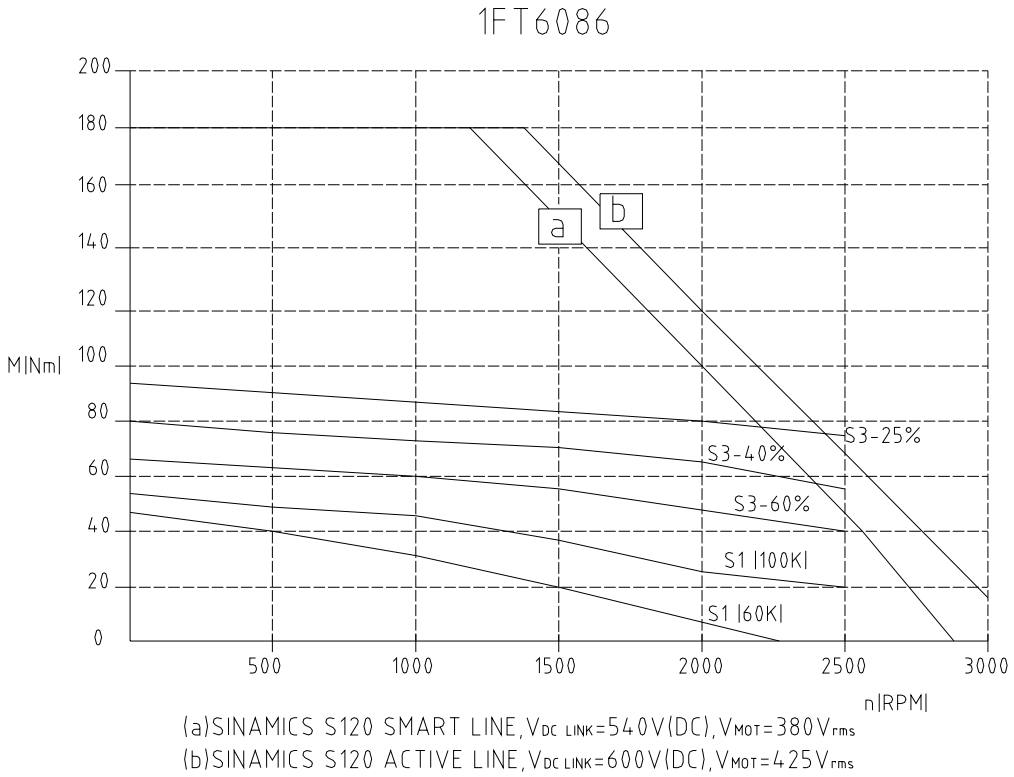
PN [KW]	nN [RPM]	MN [Nm]	IN [A]	nmax [RPM]	Tth [min]	J [kgm2]	M [kg]
17	1000	162	43	10000	30	0.109	130



＊Note: Customer can specify the spindle motor specification with same horsepower.

2.4.4 Turret Motor Torque Curve

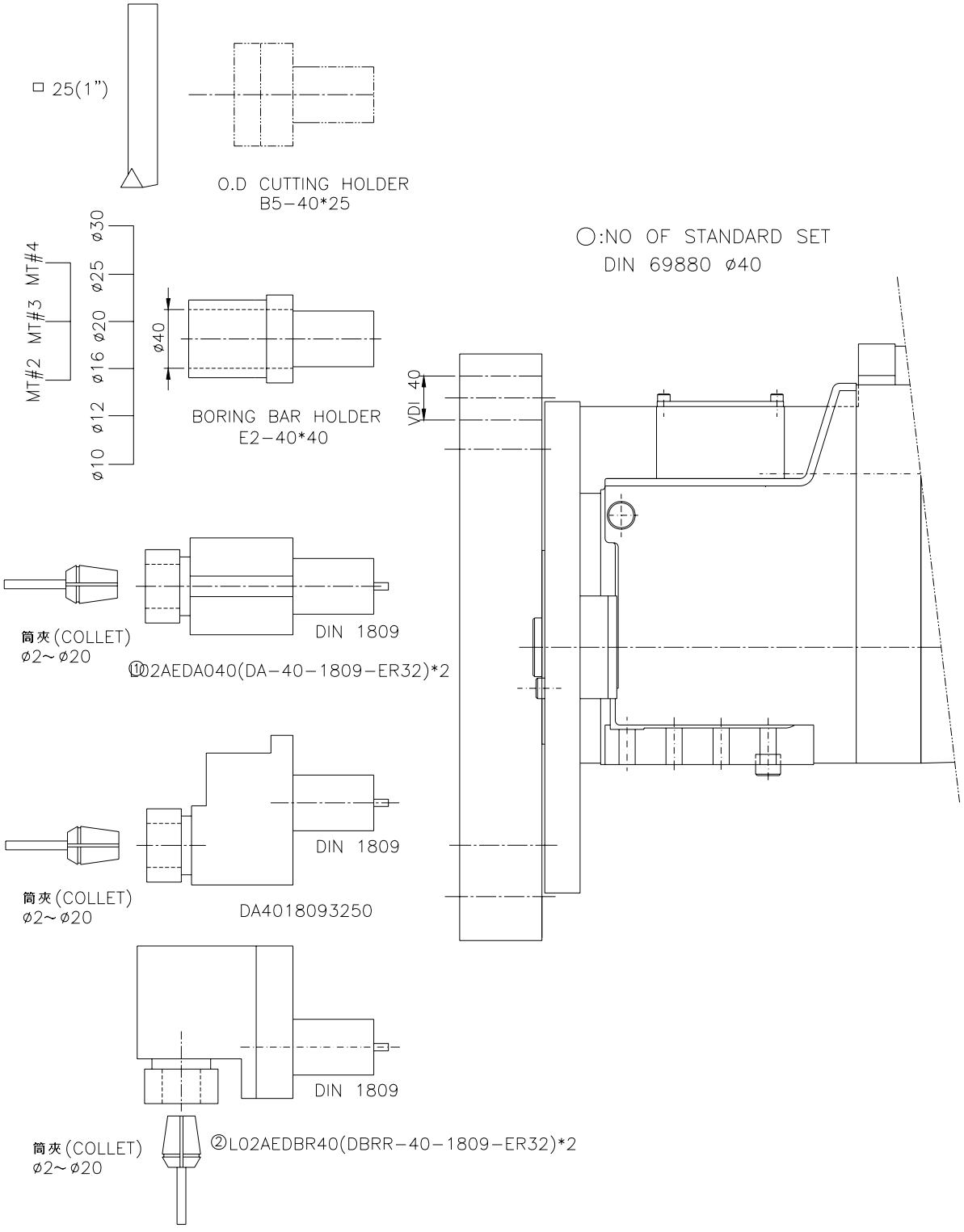
1FT6086-3000rpm/ON MODEL T-7M TURRET



＊Note: Customer can specify the spindle motor specification with same horsepower.

2.5 Tooling Diagram

∗Note: Please contact with Leadwell for request of tool holders and sleevs.



Preparation Before Machine Setup

Contents

3. Preparation before Machine setup

3.1 Foundation Requirement……... 3-1

3.2 Surrounding Requirement……. 3-2

3.3 Power Source Requirement…...…… 3-4

3.3.1 Power Specification…… 3-4

3.3.2 Oil Specification……. 3-5

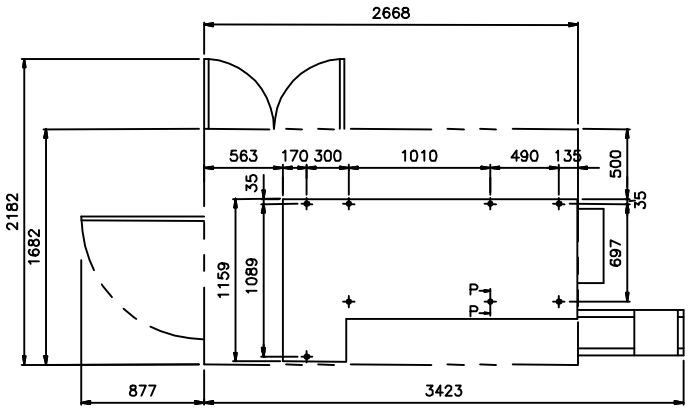
3.3.3 Air Specification…… 3-6

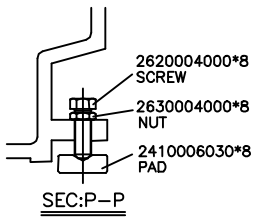
3. Preparation before Machine setup

The place and transportation passage should be cleaned completely before machine installed, and firm the foundation base indeed, at the same time to ensure the machine accuracy and life, you should consider the influence of the surrounding to the machine to adopt the suitable measure to satisfy "foundation requirement", "surrounding requirement", and "power source requirement" to installation space.

3.1 Foundation Requirement

(1) When hook type foundation blot is required, please contact with Leadwell for detailed information.
(2) The foundation base must be able to support load over 5 tons/m^2.
(3) The below layout shows the area occupied by machine and the location of foundation bolt and cable connection. To ensure for safe maintenance in the future, the distance between the machine body to the surrounding device must be at least 500mm. Therefore the installation space needs minimum 5300mm*2700mm*2400mm.

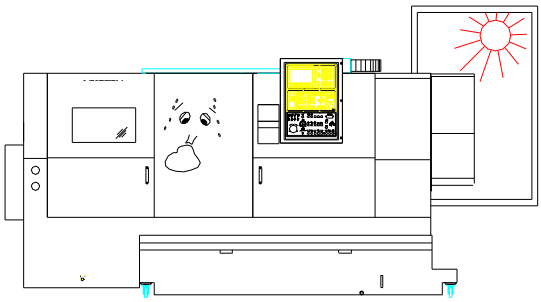




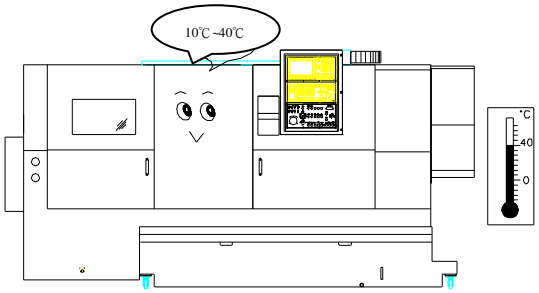
SEC:P–P

3.2 Surrounding Requirement

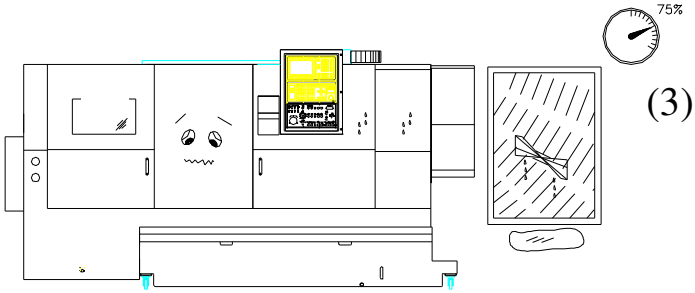
Please keep pleasant working environment according to advice as follows.



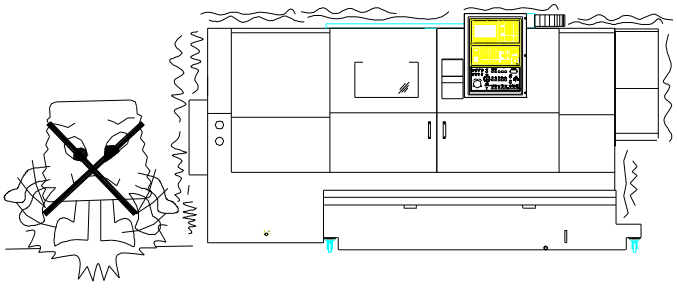
(1) Don't expose machine and NC under direct sun light.



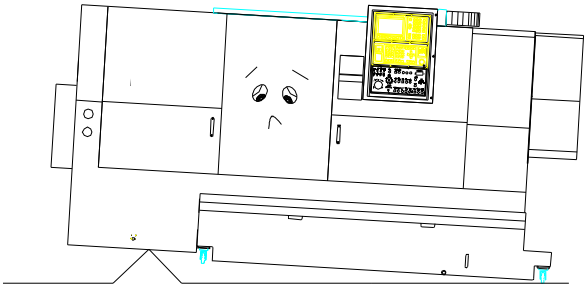
(2) Keep machine surrounding temperature within 10℃~40℃.



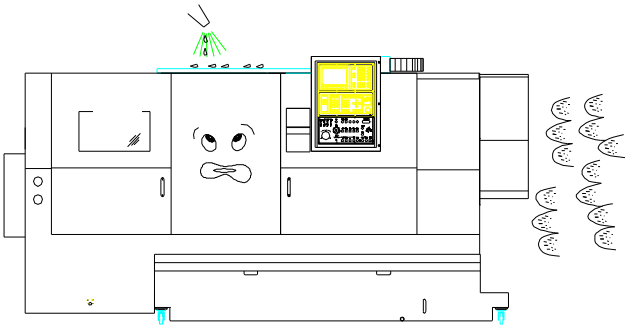
(3) Keep machine surrounding humidity under 75% to ensure to operate the electric equipment normally.



(4) Make sure or solid foundation base, and avoid nearby press punch with high vibration.



(5) Please notice the fatness of the ground will affect machine accuracy.



(6) Avoid air dust or dropped liquid to gather on machine.

3.3 Power Source Requirement

3.3.1 Power Specification

Items	T-7M
Total power requirement	40/40KVA
Frequency	50/60Hz±1%
Input Voltage	200/220/380/420/440±10%
(1) spindle motor	15.0/18.5 kw
(2) electrical cabinet accessory	7.1 kw
①hydraulic pump motor	0.75 kw
②coolant pump motor	1.0 kw
③lube pump motor	0.003 kw
④work lamp	0.06 kw
⑤chip conveyor (option)	0.2 kw
⑥X servo motor	2.1 kw
⑦Z servo motor	2.1 kw
⑧other (option)	0.327 kw
(3) NC controller	1.1 KVA

Note:

(1)Please compare the factory voltage with machine's specified voltage.

(2)The machine must be protected from electrical noise source such as electric welders and an electrical discharge.

(3)A leak breaker for the power supply will be installed by customer. The rated current is 30 mA for the breaker.

(4)Connect the power cable directly front the power supply of the shop. Inside the electrical cabinet of machine, there is one connecting point (marking PE) for protective external connection.

☞ ※ Caution: Power requirement data

(1)Allowable voltage fluctuation: ACV, ±10%

(2)Allowable voltage drop: within 15% of nominal voltage for 0.5 seconds.

(3)Allowable frequency fluctuation: ±1Hz

(4)Allowable voltage impulse:
Peak value: less than 200% of effective value (rms value) of the line voltage.

Duration: less than 1.5 msec.

5) Allowable waveform distortion of AC voltage: less than 7%

6) Allowable imbalance of line voltages: less than 5%

3.3.2 Oil Specification

OIL USAGE RECOMMENDATION				
BRAND / ITEM	MOBIL	SHELL	ESSO	CASTROL
LUBRICATOR OF PNEUMATIC	RARUS 424	CORENA S32	TERESSO 32	HYSPIN VG32 PERFECTO T32
AUTO LUBRICATOR SYSTEM (FOR SQUARE WAY)	VACTRA 2	TONNA T68	FEBIS K68	MAGNA BD68
AUTO LUBRICATOR SYSTEM (FOR LINEAR WAY)	VACTRA 1	TONNA T32	FEBIS K32	MAGNA GC32
SPINDLE	VELOCITE 12	TURBO T32	SPINESSO 22	HYSPIN VG32 PERFECTO T32
HYDRAULIC SYSTEM	DTE LIGHT	TELLUS 32	NUTO H32	HYSPIN AWS32
GEAR OF ROTARY TABLE	MOBILGARD	OMALA 150	SPARTAN EP 150	ALPHA SP150
SPINDLE MOTOR GEAR BOX	DTE HEAVY MEDIUM	TELLUS 68	NUTO H68	ALPHA SP68

※ Note: 1) It is use M12 Pneumatic lubricant from China Petro Company Ltd.

2) The additive on cutting oil will affect human health or machine, please contact with oil supplier.

3.3.3 Air Specification（Option）

(1) The air flow capacity depend on frequency of auto door function and spindle air blast. Leadwell recommend to use 3 Hp air compressor.

(2) The air pressure setting for this machine is 6 kg/cm^2

Transportation

Contents

4. Transportation

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4.3 Unpacking Machine…….. 4-3

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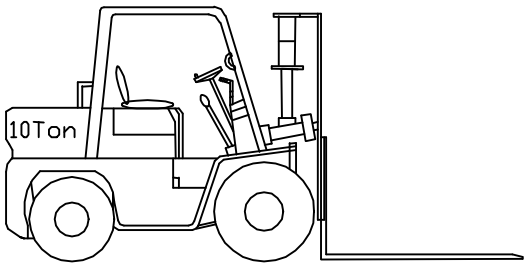
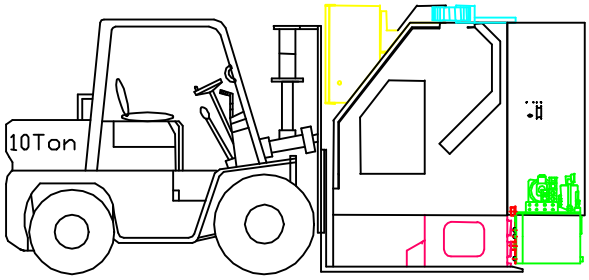
4. Transportation

4.1 Requirement of equipment



1) Only an authorized forklift driver can drive the lift.



2) The forklift capacity should be overweighted 20% of this machine.

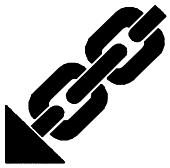
※Note: This machine has net weight 4800 kg, gross weight 5800 kg including wooden box.

4.2 Marking on Wooden Case

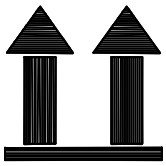
The meaning of its mark is as following:

①Easy broken goods

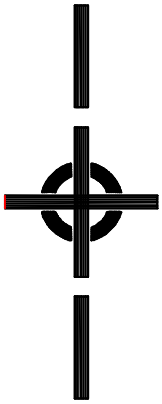
②Prevent from water



③Hanging position



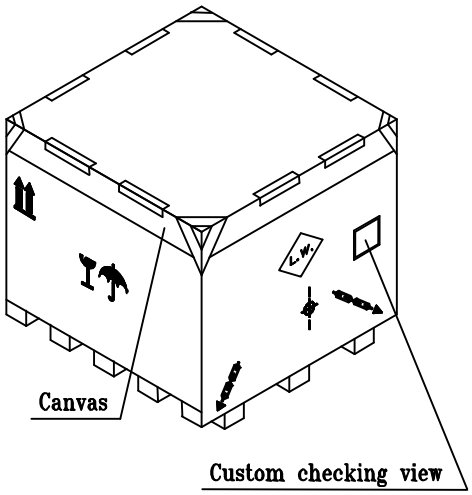
④This side up



⑤Center of gravity

4.3 Unpacking machine

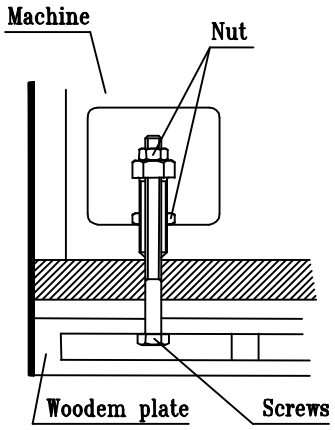
This machine is packed by rust protective bag or aluminum foil and either packed both wooden case or none wooden case. If unpacking wooden case is necessary, please follow steps as below.



1) Unpack the canvas at top of the case.

2) Unpack the wood board on the top and around of the case.

3) Remove the packed rust protective bag.



4) Remove the machine's accessories.

5) Refer to the drawing on the left to loosen and remove the screws and nuts.

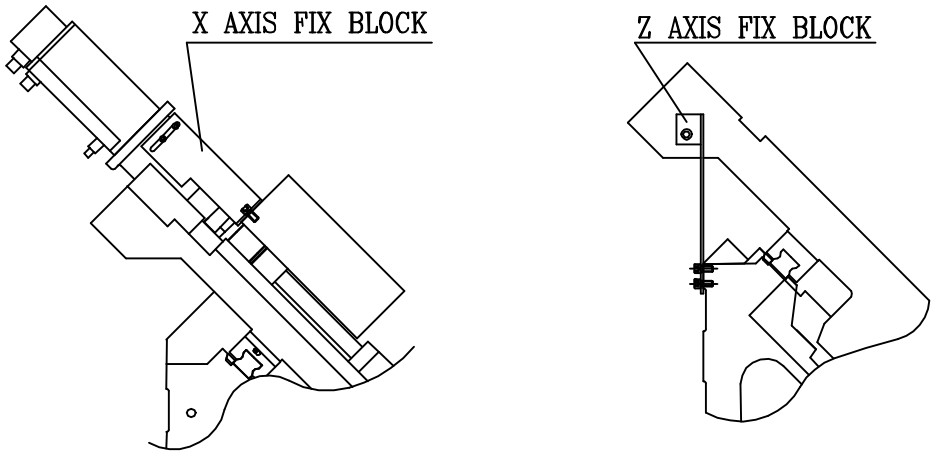
4.4 Moving Machine after Unpacking

4.4.1 Confirming fixed Bracket on Machine

Make sure that X axis fastening bracket, Z axis shipping fastening bracket and tailstock fastening bracket (or tailstock shipping fastening) must be tight locked.

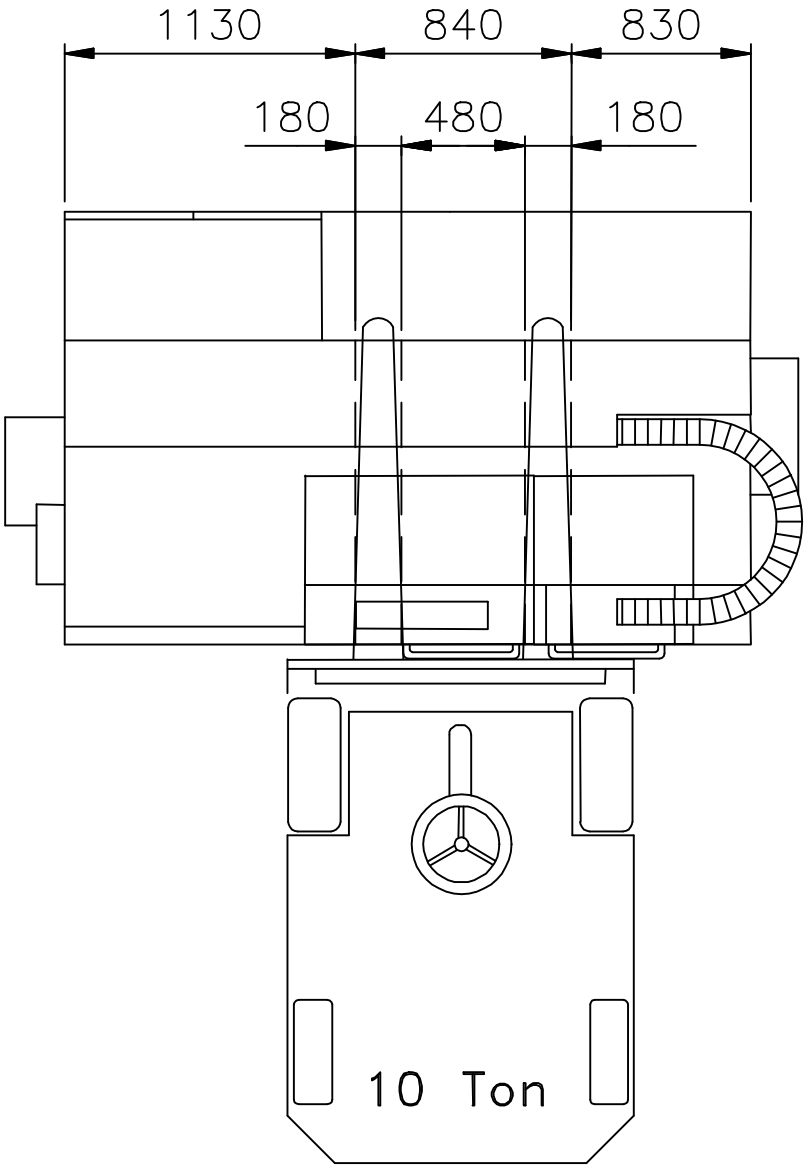
※ We attach tailstock fastening bracket for machine with option programmable tailstock.

※Yellow painting indicate machine shipping fastening bracket.



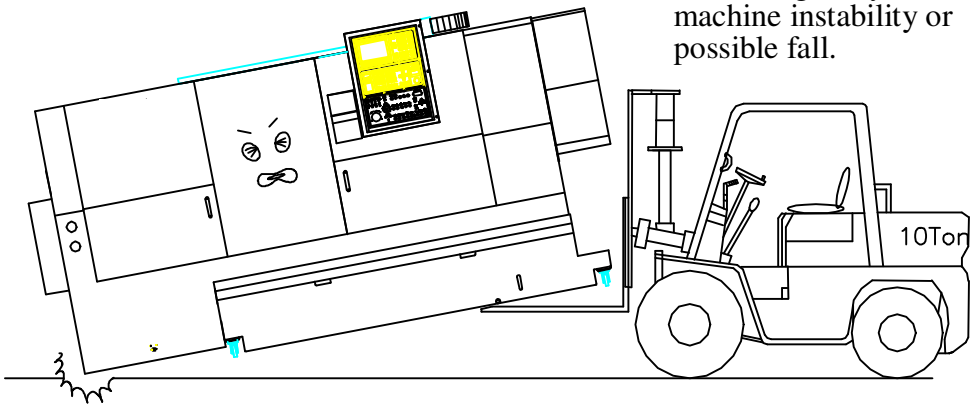
4.4.2 Fork Lifting Machine

When machine is on wooden case bottom, the length of the key in front of fork needs to use over the wooden case bottom, and can support overweight 20% of this machine.



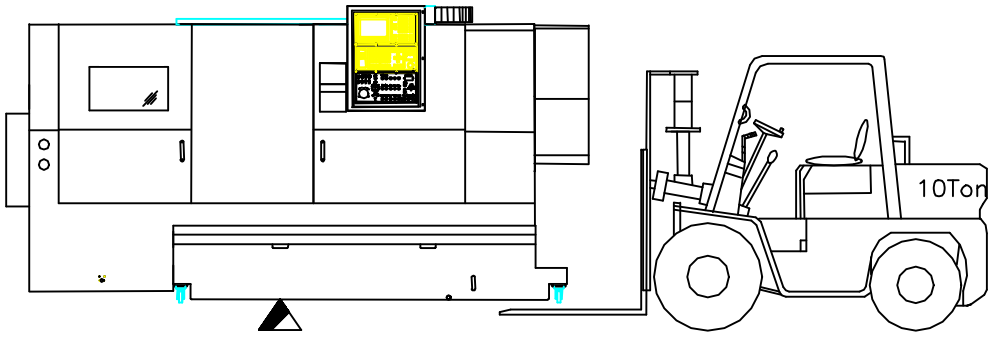
WARNING

2) Forks too short or too far from center of gravity will result in machine instability or possible fall.

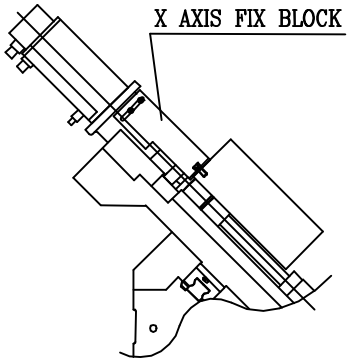


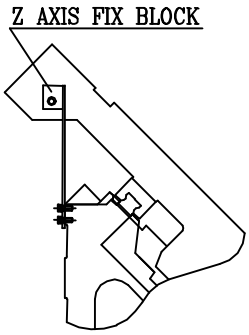
CAUTION

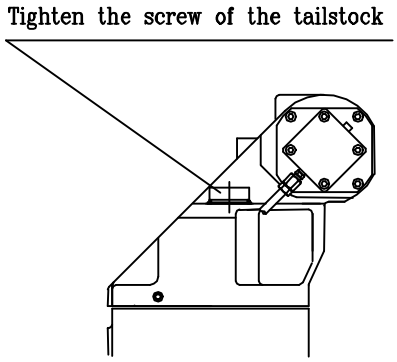
3) When driving forklift, the location of gravity center must be considered.

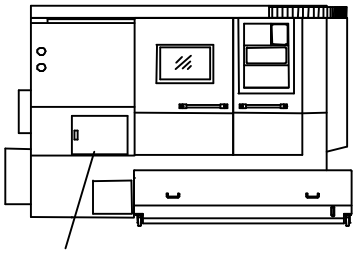


4.5 Relocating of Machine









Support the safety door by wooden bar

(1) X, Z axes home return.

(2) disassemble the rear cover of machine.

(3) Fix X axis by fastening slide block. (No.4100089010)

(4) Fix Z axis by moving MPG till the saddle fixed bracket was fastened. (No.4100083010)

* This job must be carefully done with another person's assistance.

(5) Fastening tailstock and make sure tighten the lower block of the tailstock

(6) Fix front doors with door lock.

(7) Fix operation panel box by tightening screws under the box.

(8) Disconnect the coolant pump wires and remove the coolant out from the machine.

(9) turn off operation panel power, and then turn off main power to remove the power cables to close cabinet door.

(10) Relocate the machine according to sechtion 4.4

Installation

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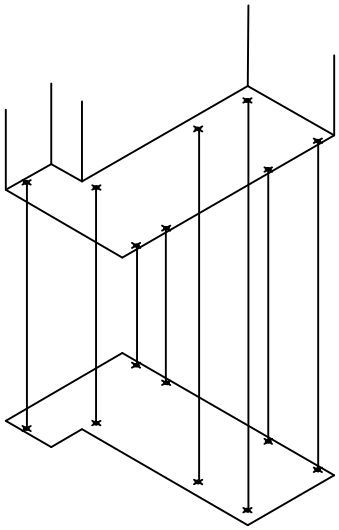
5. Installation

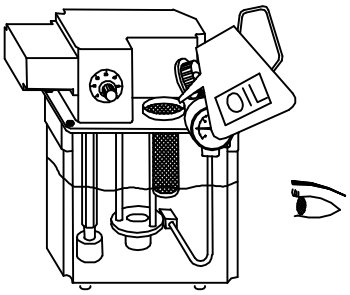
5.1 Machine Installation



1) Clean up the space necessary for machine installation.

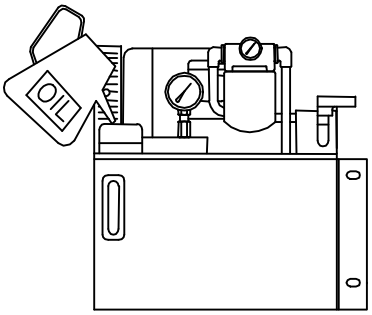
2) Make sure once again that the space for machine installation is enough. The space required is necessary to fit as described in chapter 3.1.

3) According to the drawing's indication as chapter 3.1, put the machine on the foundation, and put the foundation block on the marked position.



4) According to the steps of chapter 4.5, and follow the opposite sequence to disassemble the fix bracket.

5) Take away the humidity absorbing bags in the spindle zone and inside cabinet.



6) Clean up two axis moving chip guard.

7) Fill in clean lubrication oil into oil tank till the oil is filled to middle level line.

8) Fill new and clean hydraulic oil till its upper line.

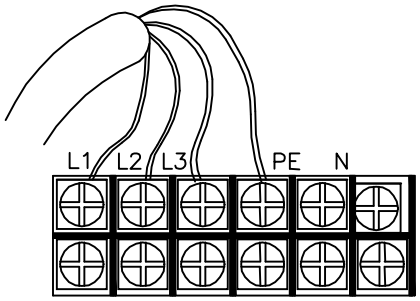
＊Note：1.Refer to the sticker of oil recommendation list on the machine and fill in the necessary oil.

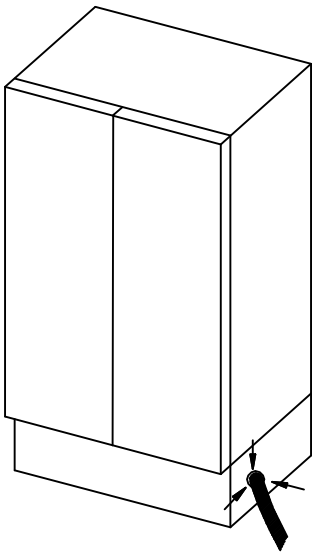
2.If machine is installed with angle bolt, please contact Leadwell in advance for further foundation drawing.

SERVICE

5.2 Power on Machine

5.2.1 Cable Connection





1) Make sure the『EMERGENCY STOP』switch is in OFF position..

2) Connect cable to the main power terminal port in the cabinet and make sure to screw it tight.

3) Make sure once again the matching voltage and phase are the same with machine specification.

4) Please connect ground wire to PE terminal in terminal seat, ground resistance should be less than 100Ω. Any question concerning grounding, please contact local Leadwell agent.

5) To prevent dust entering into cabinet, please use water proof plug or seal with silicon glue.

6) Please install device to detect electrical leakage.
（Specifications：30mA）。

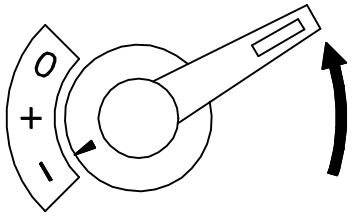
7) Output cable connect specification:14mm^2

5.2.2 Inspection before Power On:

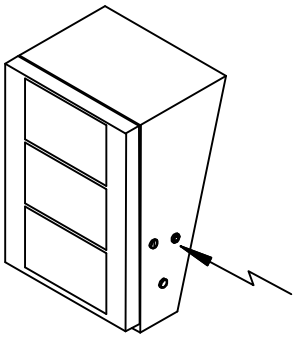
(1) Make sure that the machine's power source is according to machine requirement.
(2) Make sure power cable diameter is 14mm^2, and correctly connected phases.
(3) Make sure that outside grounding is installed.
(4) Make sure that the power supply side is fitted breaker with sensitivity specification 30mA.
(5) Make sure the cabinet is well closed.
(6) Make sure all the foundation bolts are securely tightened.
(7) Make sure that fix brackets are removed.
(8) Make sure the chuck is tightly mounted, and there is nothing loose.
(9) Make sure that lubrication oil is full in lubrication oil tube.
(10) Make sure that hydraulic oil tank is already filled with suitable quantity of oil.
(11) Make sure there is nothing loose on turret, and there is not sliding dropped problem.
(12) Make sure that the limit switch which control axis travel and dog are not loosen.
(13) Make sure that the spindle drive belt is assembled with suitable tension.
(14) Check if oil pipe or coolant pipe have any breakage or looseness.
(15) Make sure that the protecting guard and safety door are well closed.
(16) Make sure that there is no irrelevant objects nearby.
(17) Make sure the EMERGENCY STOP switch button is at OFF condition.
(18) Make sure all pressure indicator is at "0" position.

5.2.3 Inspection after Power on:

※Before executing this item, please read “operation manual” to understand all buttons' function and operation procedures.

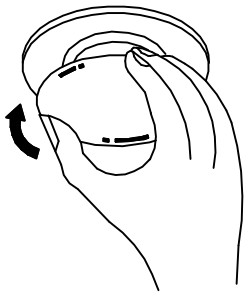


1) Turn the main power switch to " | " position.



2) Make sure the correct hydraulic oil pump rotation. The cw rotation will have make oil pressure indicator work. If for wrong rotation, please stop the machine according to instruction in chapter 5.2.1, and reverse L1 and L3 power cable phase.

3) Turn on the operation panel box power (on right or left side of operation box)



4) Turn the 『EMERGENCY STOP』 switch to right side to release STOP situation.

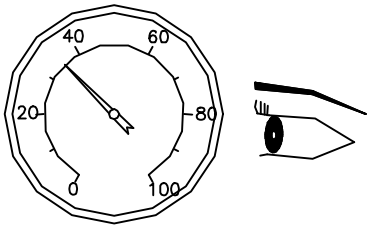
5) Make sure that NC POWER 『ON』、『OFF』 button functions normally.

6) Make sure that all buttons of manual operation unit function normally according to electric instruction manual

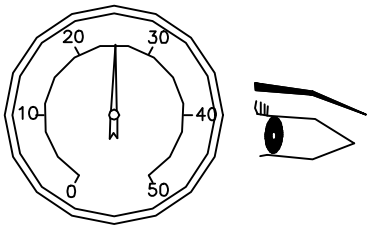
7) Make sure the output cable is normal.

8) Machine and the space around the machine cannot have oil.

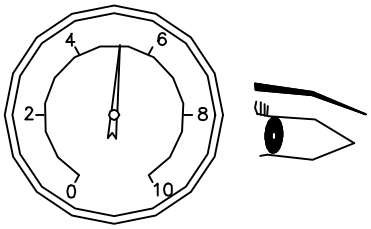
9) Check if all of the rotating components function normally



10) Check if hydraulic main pressure was indicated at 35kgf/cm^2.

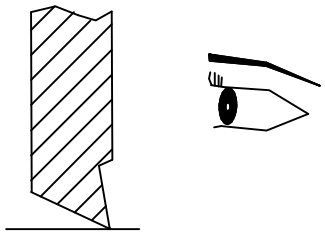


11) Check if chuck/tailstock pressure is normal.
Chuch：10~25kgf/cm^2
Tailstock：10~20kgf/cm^2



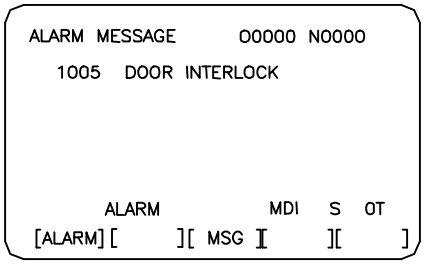
12) Check if pneumatic pressure is sufficient. (Standard pressure is：4~6kgf/cm^2)

※This pneumatic pressure is option.



13) Please refer to Electric Instruction Manual operation indication. Use manual mode to operate MPG and move two axis slideways to make sure the lubrication oil is well dispatched.

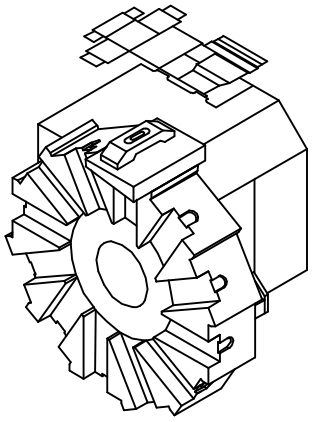
14) Make sure that there is no chips on the wiper.

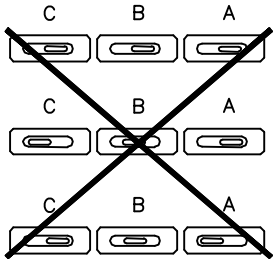


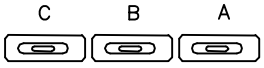
15) Make sure that there is no ALARM message.

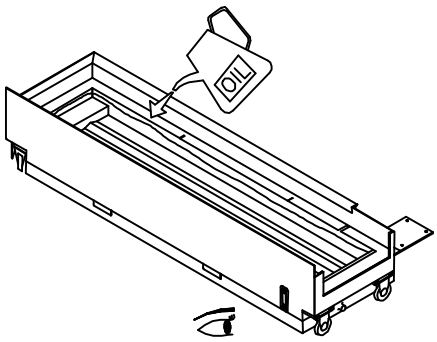
5.3 Leveling Adjustment

The machine must be adjusted level and accuracy very carefully, because the first installation has a huge influence to the machine's accuracy and life.









1) Take the level adjustment plate and then put level gauge on.

2) Example:
   A point: Both X axis and Z axis are on original point.
   B point: X=0.000，Z=-250.000
   C point: X=0.000，Z=-500.000

3) Please change the operation mode to manual operation mode, move Z axis direction, from A point via B to C point, move forward and backward to check level gauge's readout variation amount, then adjust the foundation bolts accordingly.

4) It's most important to level on Z axis direction accurately by adjusting the foundation bolts till the allowed readout.

5) Further, reverse the level gauge direction to check if level is concave, convex or inclined which should not be allowed because accurate foundation level will do much good for a machine.

6) After right and left level adjustment is done, check front and back level, adjust till all level is complied to allowed accuracy.

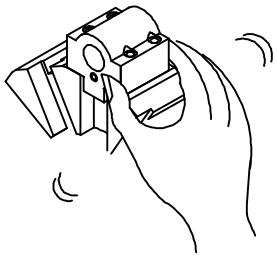
7) After adjustment, push the water tank back to the machine bottom, and add coolant into the tank till the water up to middle level line.
   ※If the machine is with chip conveyor, it is also necessary to mount it.

※Caution: 1. After level adjustment, it must be sure that all of foundation screws and its locknuts are tight. (Only that can make machine's eight endured evenly and totally by foundation screw. Thus, machine can be more steady.)

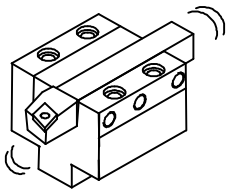
2. Level precision should be 0.04 mm/M (0.0005 in/ft).

5.4 Test-Cutting

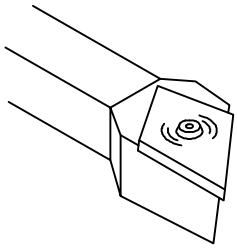
5.4.1 Checklist before test-cutting



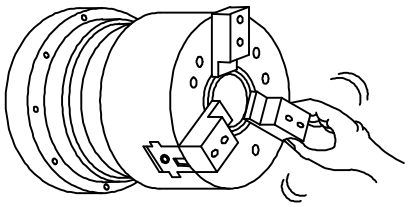
1) Make sure that the tool holder is well locked



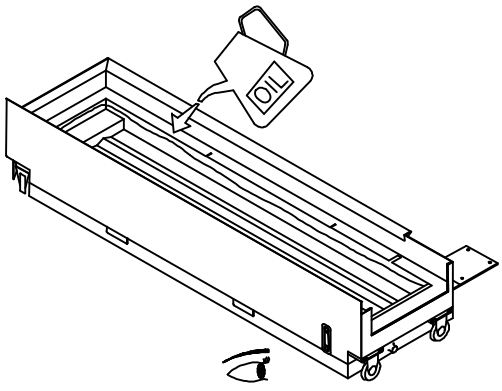
2) If the tool is well locked on the tool holder.



3) If the cutting tool is also tight locked.



4) If the jaws on the chuck fixed steady.

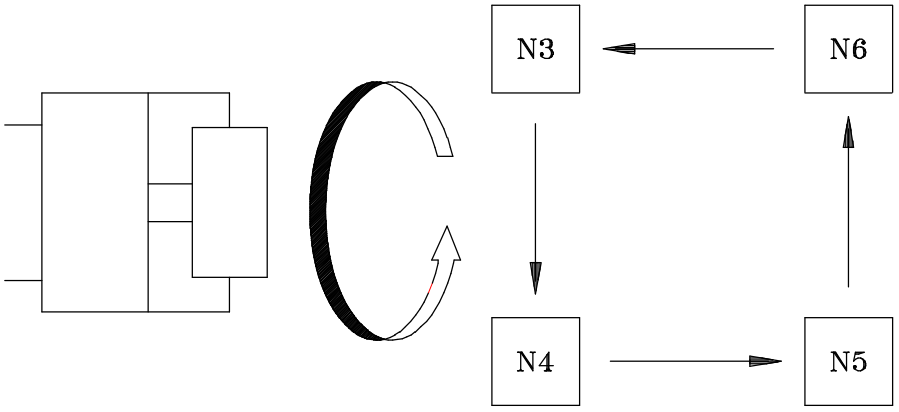


5) The coolant in the coolant tank needs to be enough.

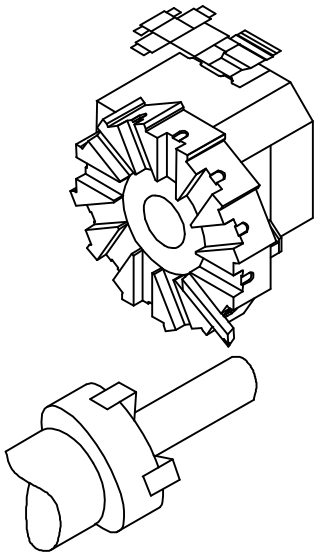
5.4.2 Warming up machine

To make sure the precision of cutting and workpiece, warming up machine sufficiently is definitely necessary. The following is program example we suggest to run to warm up machine at least 25 minutes.

```
00001
N001 G50 S2000 *
N002 G97 S1000 M03 *
N003 G00 W-100 *
N004 U-100 *
N005 G28 U0 *
N006 G28 W0 *
N007 G04 X2 *
N008 M99 *
```



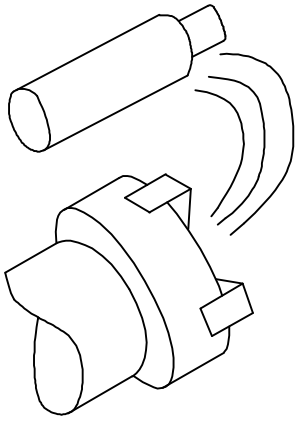
5.4.3 Test-Cutting



1) We suggest to take a workpiece of φ 50mm*100mm long medium carbon steel (S45C) for test-cutting.

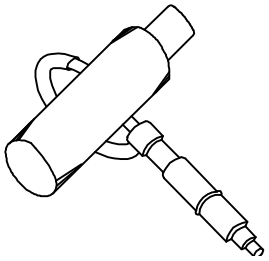
2) Select a R0.4 outer diameter tool.

3) Workpiece clamping portion must be longer than 40mm, then tailstock is not necessary.



4) Adjust chuck pressure to between 10~25 kgf/cm^2.

5) Cutting condition:
Cutting speed: V=200 m/min
Cutting depth: 0.1mm~0.2mm/on one side.
Speed: 0.1~0.15 mm/rev



6) The cylindericity of measured workpiece should be within 12 μm as standard. If the standard is not met, then machine level need to be readjusted.

Operation

Operation Instruction (Please refer to Operation Manual)

Maintenance & Cleaning

Contents

7. Maintenance & Cleaning

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7.3.4 Cleaning Coolant Tank……... 7-13

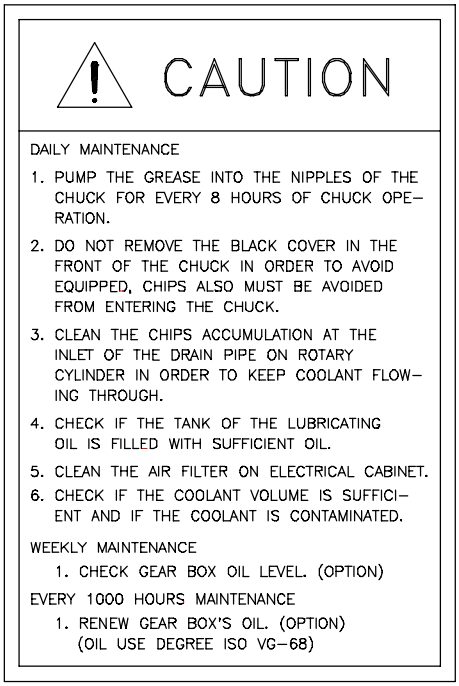
7.3.5 Cleaning Air Filter Regulator……. 7-14

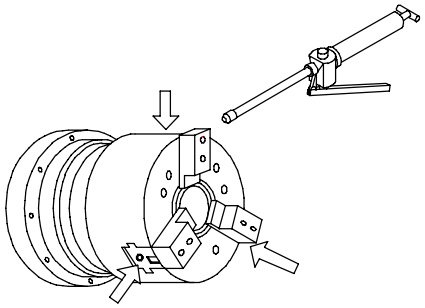
7. Maintenance & Cleaning

7.1 Daily Maintenance Procedures

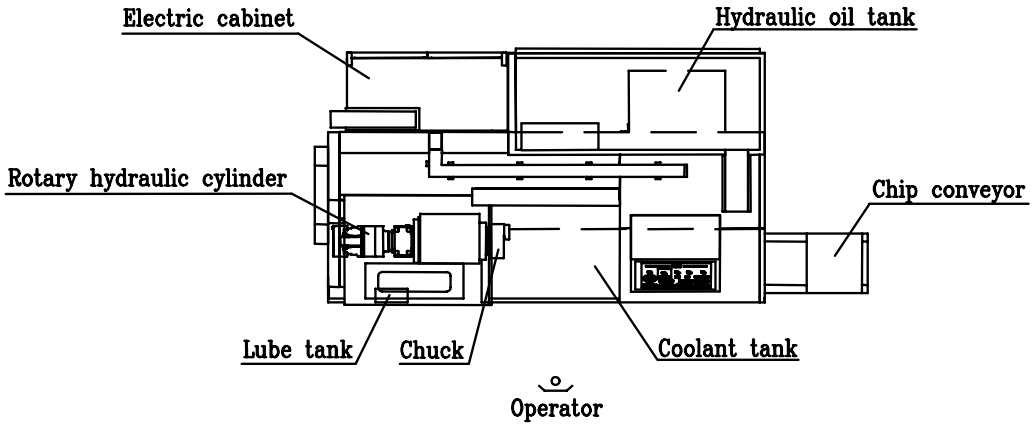
(1) Follow the sticker "Lathe Daily Maintenance Checklist" on the machine to do maintenance and inspection every day.

※Chuck: Every day before operating machine, use grease gun to fill in at least 5 gram grease so that the chuck can work smoothly.


CAUTION
DAILY MAINTENANCE
1. PUMP THE GREASE INTO THE NIPPLES OF THE CHUCK FOR EVERY 8 HOURS OF CHUCK OPE-RATION.
2. DO NOT REMOVE THE BLACK COVER IN THE FRONT OF THE CHUCK IN ORDER TO AVOID EQUIPPED, CHIPS ALSO MUST BE AVOIDED FROM ENTERING THE CHUCK.
3. CLEAN THE CHIPS ACCUMULATION AT THE INLET OF THE DRAIN PIPE ON ROTARY CYLINDER IN ORDER TO KEEP COOLANT FLOW-ING THROUGH.
4. CHECK IF THE TANK OF THE LUBRICATING OIL IS FILLED WITH SUFFICIENT OIL.
5. CLEAN THE AIR FILTER ON ELECTRICAL CABINET.
6. CHECK IF THE COOLANT VOLUME IS SUFFICI-ENT AND IF THE COOLANT IS CONTAMINATED.
WEEKLY MAINTENANCE
1. CHECK GEAR BOX OIL LEVEL. (OPTION)
EVERY 1000 HOURS MAINTENANCE
1. RENEW GEAR BOX'S OIL. (OPTION)
(OIL USE DEGREE ISO VG-68)



(2) The daily maintenance can be executed by referring formats as per following chart.



Daily Inspection List

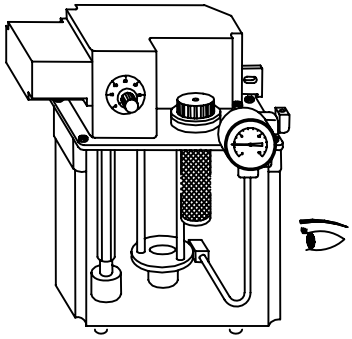
Item	Check list / Date	1	2	3	4	5	6
1	If the pressure setting is suitable						
＊2	If the air filter regulator works normally						
3	If the machine part make noise						
4	If operation switch and indicator light are normal						
5	If there is oil leakage						
6	If the hydraulic oil tank level is normal						
7	If the lubrication oil tank level is normal						
8	If the coolant tank level is normal						
9	If the chuck is greased						
10	If the chuck proximity switches are clean without any chip						
11	Clean the dust on air filter						
12	Clean the chips on chuck cylinder drain outlet						
13	Clean the chips on machine base						
	Inspector’s signature						
	Supervisor						

Note： Mark “＊2” indicate the checking on filter regulator;

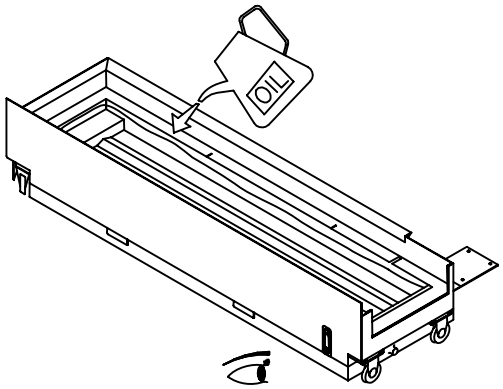
①If the oil level of oil cup is within the indicated range.

②If the water is drained.

③If there is oil leakage.

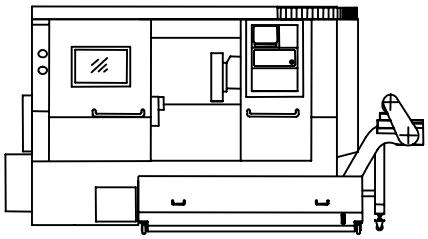


(3) Lubrication oil tank: Please keep the oil in the lubrication oil tank above the middle level line, and check if there is dirt at the bottom of the tank.



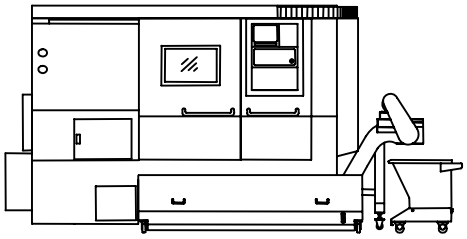
(4) Coolant tank: When coolant level is lower than the middle line of the level gauge, refill coolant water.

7.1.1 Daily Inspection after Operation



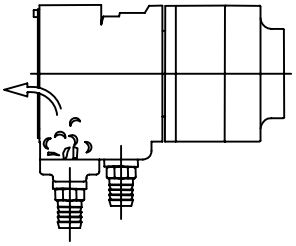
(1) Chips must be clean after daily work.

①. Inside the machine.



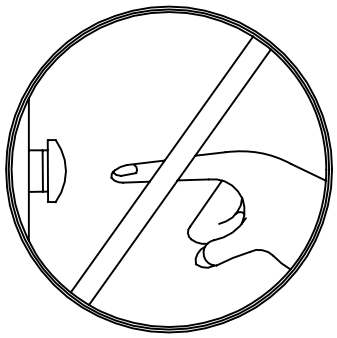
②. Chip conveyor (option)

③. Chip bucket (option)



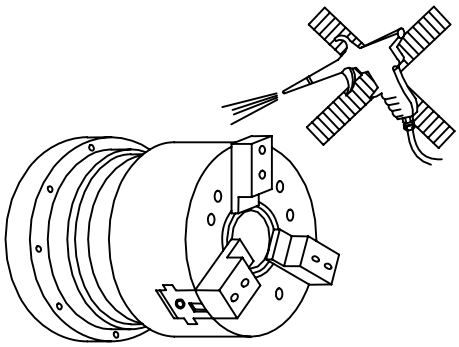
④. Chuck cylinder

＊Notice the following items when cleaning:



DON'T START MACHINE

1) The poster stand must be put on the top of operation panel box when cleaning chips on the rear the spindle. This will prevent other person operating machine.

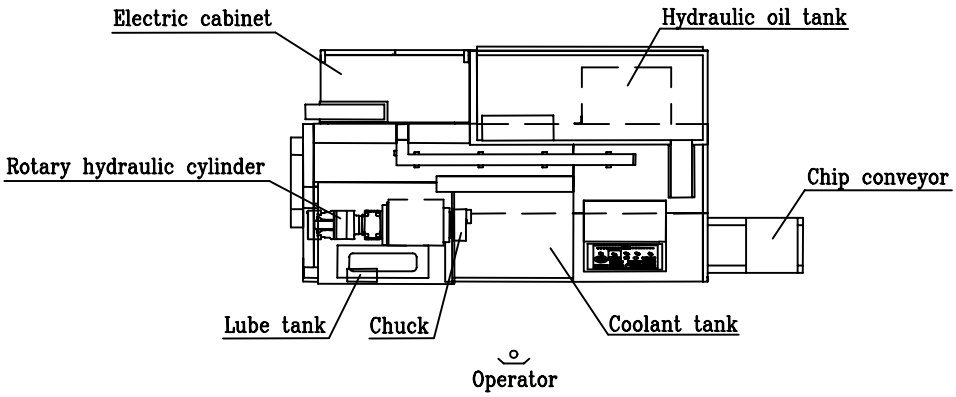


2) Spraying air by air gun toward chuck flange is prohibited to avoid the chips entering into spindle and damage the bearings.

3) Notify technical staff when replacing lubrication or hydraulic oil.

7.2 Monthly Machine Procedures

To realize monthly maintenance, to make a check list as following and check one by one.



Monthly Maintenance record card

Item	Item to Check / Month	一	二	三	四	五	六
1	Clean up the electric cabinet air filter net						
2	Clean up the pump and motor filter net						
3	Clean up the hydraulic oil tank filter net						
4	Clean up the air filter regulator receiver (option)						
5	The tightens of chip at the bottom of coolant tank						
6	Clean up the chips at the bottom of coolant tank						
7	Grease filling:A.Tailstock						
8	B.Chip cover						
9	C.Chip conveyor chain wheel(option)						
	Inspector signature:						
	Supervisor signature:						

7.3 Periodic Maintenance Procedures

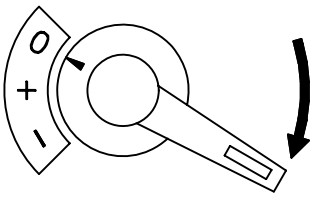
7.3.1 Check list

Maintenance description	Period	Method	Note
Vibration & Noise of Ball screw	1,000 hours	To feel	S
Noise of Spindle Motor and transmission unit	1,000 hours	To feel	S
Hydraulic Oil	1,500 hours	Replace	
Hydraulic Oil Tank Cleaning	3,000 hours	To clean	
Chuck Cleaning	1,000 hours	To clean	
Lubrication Oil Tank	1,000 hours	To clean	
Lubrication Oil Filter	2,000 hours	Replace	
Lubrication Oil Tube	1,000 hours	To lock	
Hydraulic Oil Tube	1,000 hours	To lock	
Heat Exchanger Filter Net	50 hours	To clean	
Machine Level	1,000 hours	Measure	S
Chip Conveyor Gear Reducer Grease	1,000 hours	Grease	Option
Coolant Tank Cleaning	1,000 hours	To clean	
Air Filter Regulator	500 hours	To clean	Option

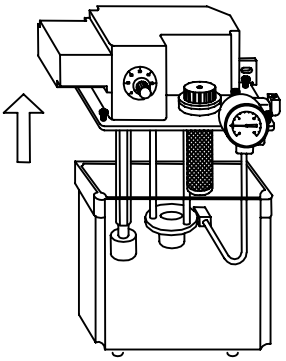
※： 1.Period counting is based on time period from machine power on to machine power off.

2.“S” indicates the end user need to contact with agent while executing this maintenance item.

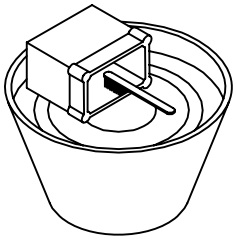
7.3.2 Cleaning Lubricator Tank



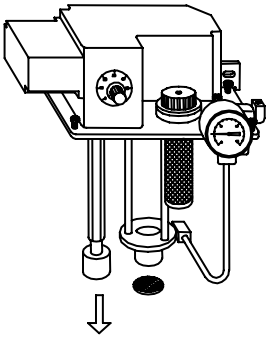
1) Turn the power off first.
(Rotating“ 0 ”position)



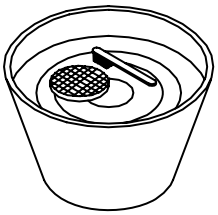
2) Open the top cover.



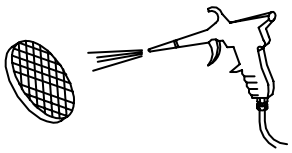
3) Clean the tank with diesel oil.



4) Take off the filter net on the outlet.



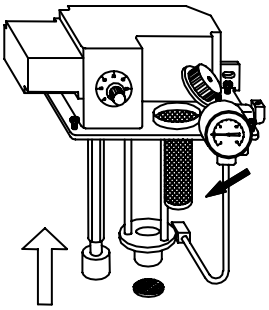
5) Clean it up in diesel oil tank.



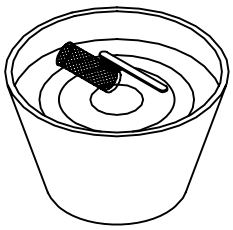
6) Dry it up with air gun.

CAUTION

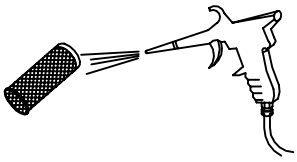
Take care with use of compressed air use only in well ventilated area taking care to avoid eyes and respiratory system.



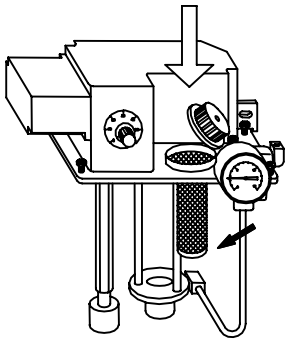
7) Take off the filter net on the inlet.

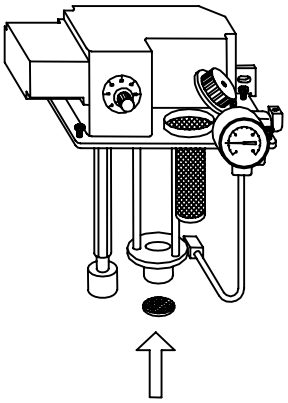


8) Clean it up in diesel oil tank.

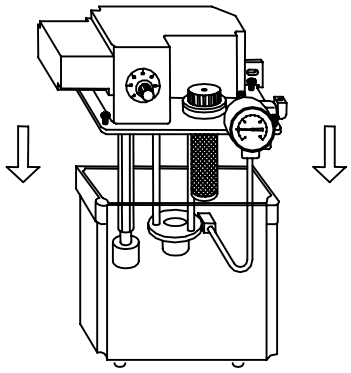


9) Dry it up with air gun.

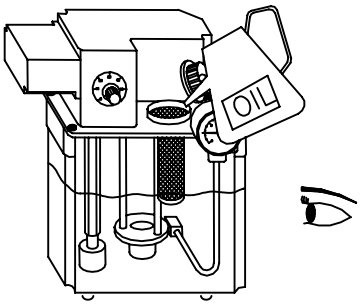




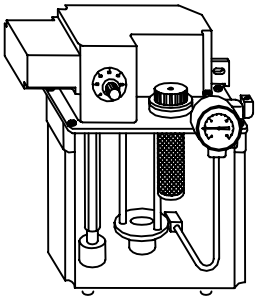
10) Mount the filter net back to the original position.



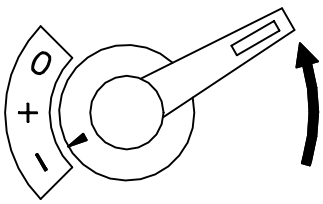
11) Fasten the tank top cover.



12) Fill the clean lubrication oil into the oil tank till above middle line.

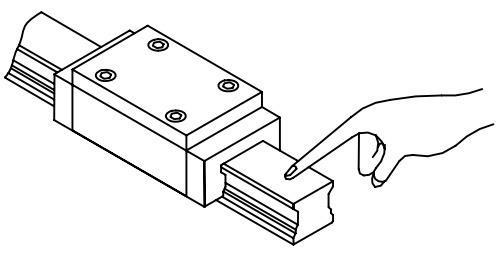


13) Turn the power on.

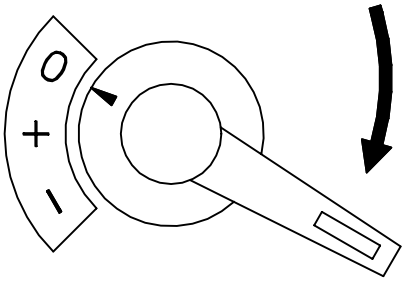


14) Check if the lubrication oil flow over on the slideways.

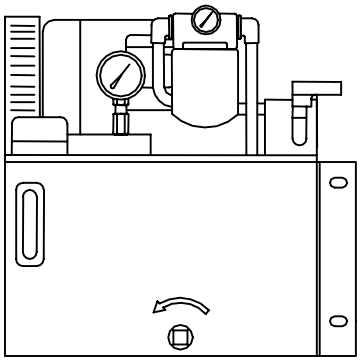
※Normally do this maintenance once every 1000 hours.



7.3.3 Cleaning Hydraulic Tank

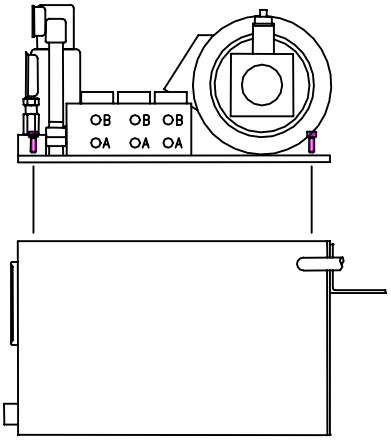


1) Turn off the power.
(Rotating “ 0 ” position)



2) Screw off the plug on the bottom of oil tank to drain out oil.

3) Open the top cover on the oil tank.

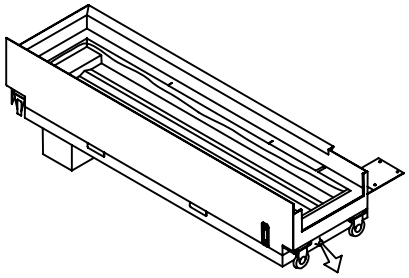


4) Clean the tank inside and filter.

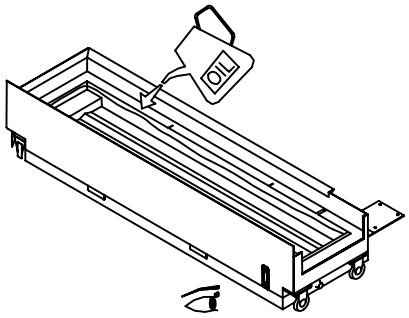
5) Mount back the cover on the oil tank and add clean new hydraulic oil till the upper limit.

※Normally maintain it once every 30000 hours.

7.3.4 Cleaning Coolant Tank



1) Drain out all the coolant in the tank and clean up the mud and chips.

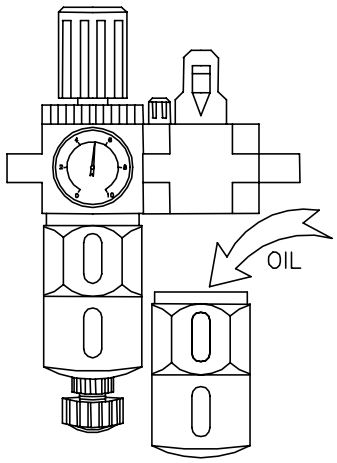


2) Add the coolant into the clean coolant tank till its middle line.

※Normally maintain it once every 10,000 hours.

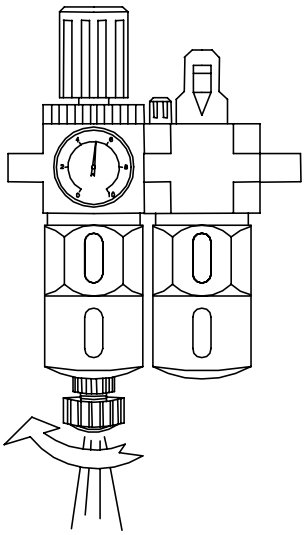
7.3.5 Cleaning Air Filter Regulator＜OPTION＞

(1)



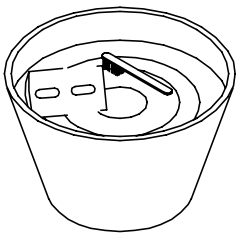
1) Screw open the oil cup of air filter regulator and add some suitable amount of oil to have effective lubrication.

(2)



2) The air filter cup will keep the condensed water which should be drained out by loosening the bottom knob.

(3)



3) After operating machines for every two weeks, take apart and clean the air filter cup.

Setting & Adjustment

Contents

8. Setting & Adjustment

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8.2 Hydraulic Pressure setting & Adjustment…….…… 8-2
8.3 Lubricator setting & Adjustment…….. 8-3
8.4 Tailstock Sensor Adjustment…… 8-4

8. Setting and Adjustment

Periodical adjusting items

Maintenance Description	Period	Method	Note
Ball screw (Pitch error)	1,000 hours	Compensation	
Back lash	1,000 hours	Compensation	
Belt tension adjustment	Half year	Adjustment	
Chuck offset with cylinder	1,000 hours	Measure	

※Note：1) The time of counting period is the time from turn on the machine to turn off the machine.

2) When doing the above adjustment, contact your agent to ask for an authorized and qualified technician to do this adjustment.

8.1 Level Adjustment

On following conditions, the machine level needs to be readjusted.

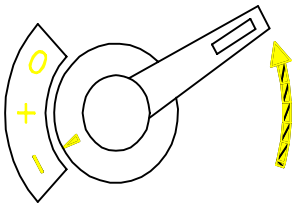
(1) Chatter during cutter.

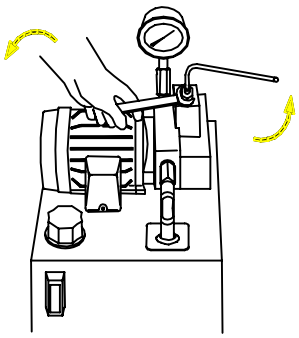
(2) Machine collisions\ due to wrong operation.

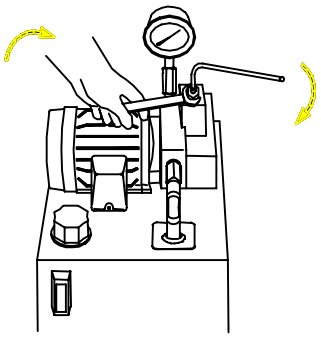
(3) Every 1,000 hours of machine operation.

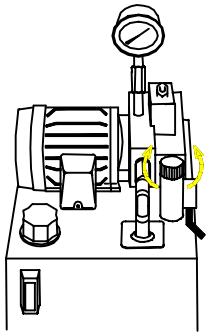
(4) The method of level adjustment, please refer to Chapter 5.3.

8.2 Hydraulic Pressure Setting & Adjustment









Hydraulic pressure adjustment：

1) Turn on the machine power.(Rotating“｜”position)

2) Loosen the screw nut of main adjusting valve by using wrench, then use hexagon wrench to nut the screw in the nut to get the required pressure setting.

※ Set pressure: 35 kg/cm^2

3) Fasten screw nut after setting.

Hydraulic pressure ALARM adjustment：

1) According to the above step1 & 2 to adjust pressure to 25 kg/cm^2.

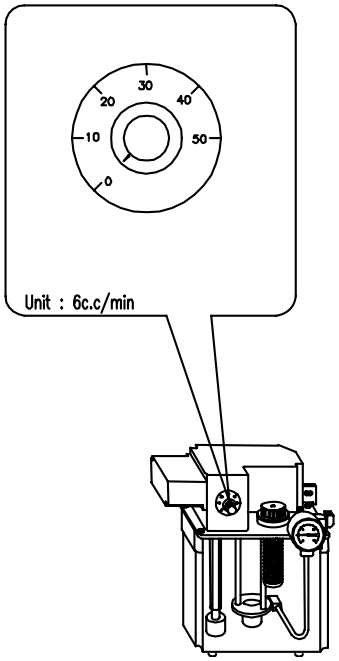
※ Set pressure alarm: 25 kg/cm^2

2) Adjust pressure switch until the buzzer rings, then fix the switch.

3) According to the hydraulic pressure adjustment step 2 to adjust back to 35 kg/cm^2, fasten screw nut after setting.

※ Now the buzzer stopped to ring.

8.3 Lubricator Setting & Adjustment



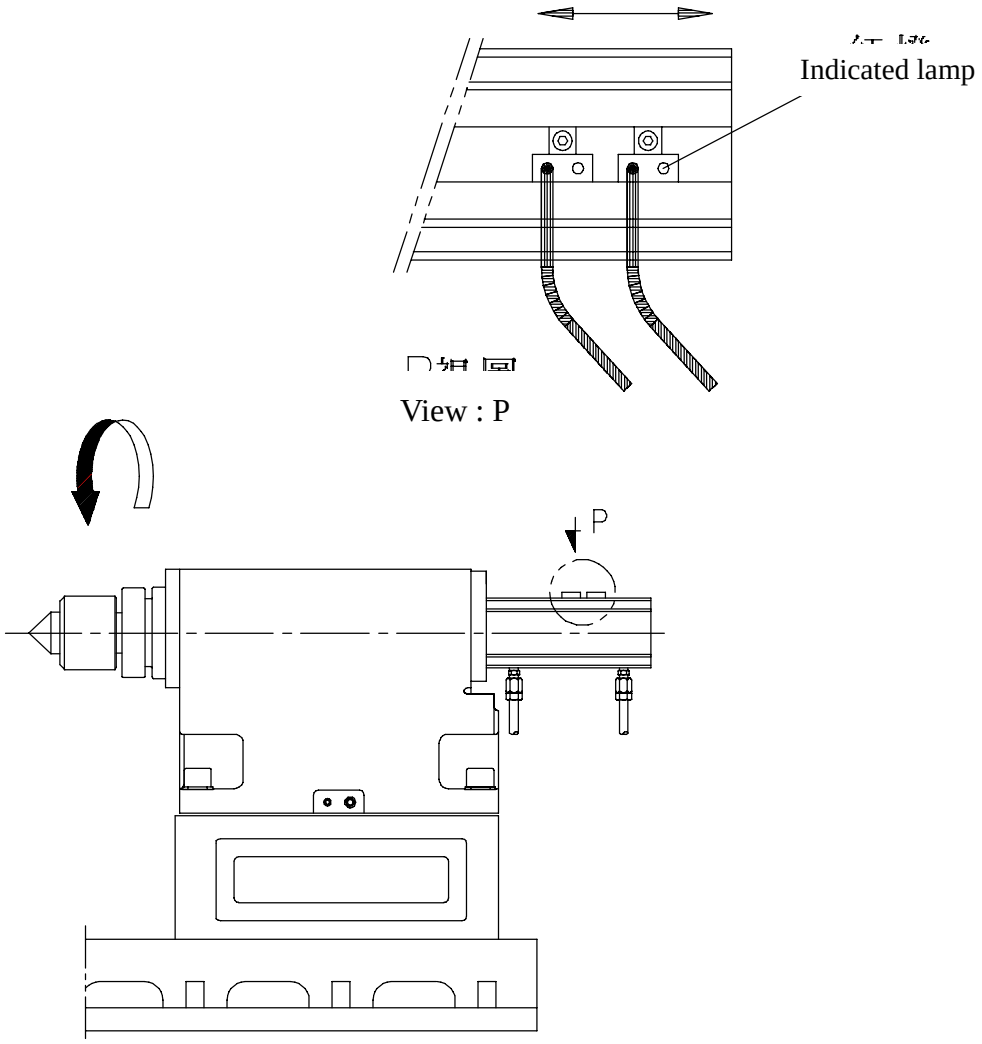
(1) Turn the botton from the range 0~60 mins.

(2) Original setting of lube is 6c.c/15mins.

(3) Customer can adjust the oil output as per different machining condition.

8.4 Tailstock Sensor Adjustment

1) Move tailstock to the proper distance from workpiece end, then lock the tailstock tightly.
2) Press the “out” button (on the operation panel), let the center engage to workpiece.
3) Loose the set screw on the electromagnetic sensor and move the sensor till the indicated lamp ON. Then tighten the set screws.



Maintenance

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9.6 Replacement Procedures of the Safety Glass…… 9-6

9. Maintenance

9.1 Maintenance of the Limit Switch on X Axis

9.1.1 Select the MPG mode and X axis which on the control panel.

9.1.2 Adjust the X axis home position.

Move the X axis toward to positive direction until the limit switch touch inside the home dog of the X axis 9-10mm, as shown in the below drawing. Now the 0 series diagnosis No. 16 bit 5(18 series:X1009 bit 0) interchange 1 into 0. If it doesn't interchange to 0, please adjust the switch till touch the home dog and the number is changed to 0.

9.1.3 Move the X axis continuously and toward to positive direction when the 0 series diagnosis number 16 bit 5(18 series:X1009 bit 0) display 0. Then, move again the X axis until the 0 series diagnosis No. 16 bit 5(18 series:X1009 bit 0) change 0 into 1. Now the limit switch to away and not touch the home dog.

9.1.4 Please move X axis again. When the limit switch touch the emergency dog, the 0 series diagnosis No. 21 bit 4(18 series:X1008 bit 0) change 1 into 0 and jump to **MDI** mode on control panel. The screen will display "**NOT READY**" message.

9.1.5 Press the **EMG.** release button. Now, move the X axis toward to negative direction and the limit switch go away the dog. Check the 0 series diagnosis No. 16 bit 5 (18 series:X1009 bit 0) and 0 series 21 bit 4(18 series:X1008 bit 0) to display 1.

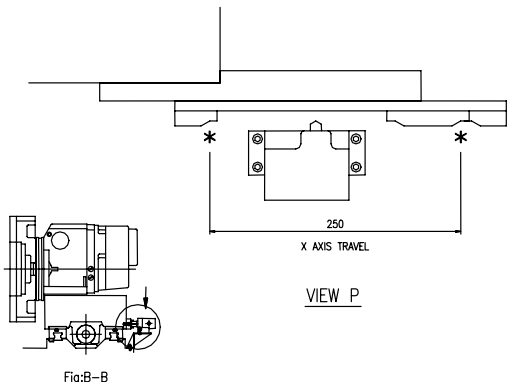


Fig:B-B

9.2 Maintenance of the Limit Switch on Z Axis

9.2.1 Select the MPG mode and Z axis which on the control panel.

9.2.2 Adjust the Z axis home position.

Move the Z axis toward to positive direction until the limit switch touch inside the home dog of the Z axis 4-6mm, as shown in the below drawing. Now the 0 series diagnosis No. 17 bit 5 (18 series:X1009 bit 1) interchange 1 into 0. If it doesn't interchange to 0, please adjust the switch till touch the home dog and the number is changed to 0.

9.2.3 Move the Z axis continuously and toward to positive direction when the 0 series diagnosis No. 17 bit 5(18 series:X1009 bit 1) display 0. Then, move again the Z axis until the 0 series diagnosis No. 17 to 5(18 series:X1009 bit 1) change 0 into 1. Now the limit switch to away and not touch the home dog.

9.2.4 Please move Z axis again. When the limit switch touch the emergency dog, the 0 series diagnosis No. 21 bit 4(18 series:X1008 bit 4) change 1 into 0 and jump to **MDI** mode on control panel. The screen will display "**NOT READY**" message.

9.2.5 Press the **EMG.** release button. Now, move the Z axis toward to negative direction and the limit switch go away the dog. Check the 0 series diagnosis No. 17 bit 5(18 series:X1009 bit 1) and 0 series 21 bit 4(18 series:X1008 bit 1) to display 1.

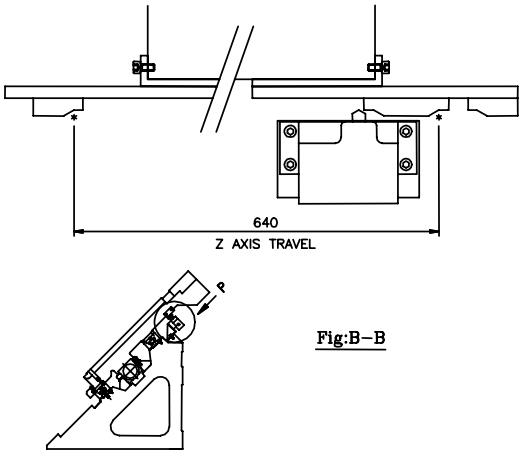


Fig:B–B

9.3 Maintenance of the Tool Setter Arm Sensor:

【Please refer to RENISHAW Manual.】

9.4 Maintenance of the Safety Switch on the Chip Guard

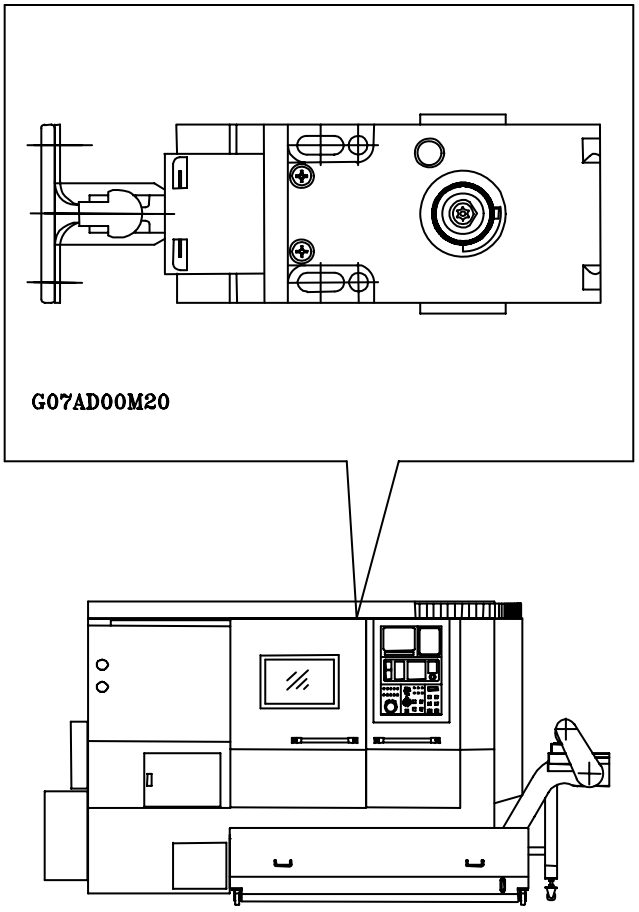
(CE Machine Only)

9.4.1 Assemble the safety switch on the fixed chip guard and close the chip door of chip guard.

9.4.2 Adjust the safety switch to touch well with actuator.

9.4.3 Check the 0 series diagnosis No.2 bit 3(18 series:X1002 bit 1) to display 1, when the chip door close.

9.4.4 Check the 0 series diagnosis No.2 bit 3(18 series:X1002 bit 0) have to display 0, when the chip door open.



9.5 Adjustment of Tension the Spindle Drive Belt

Note: Model of the belt: 5VX-1320

Adjustment is made in the following manner:

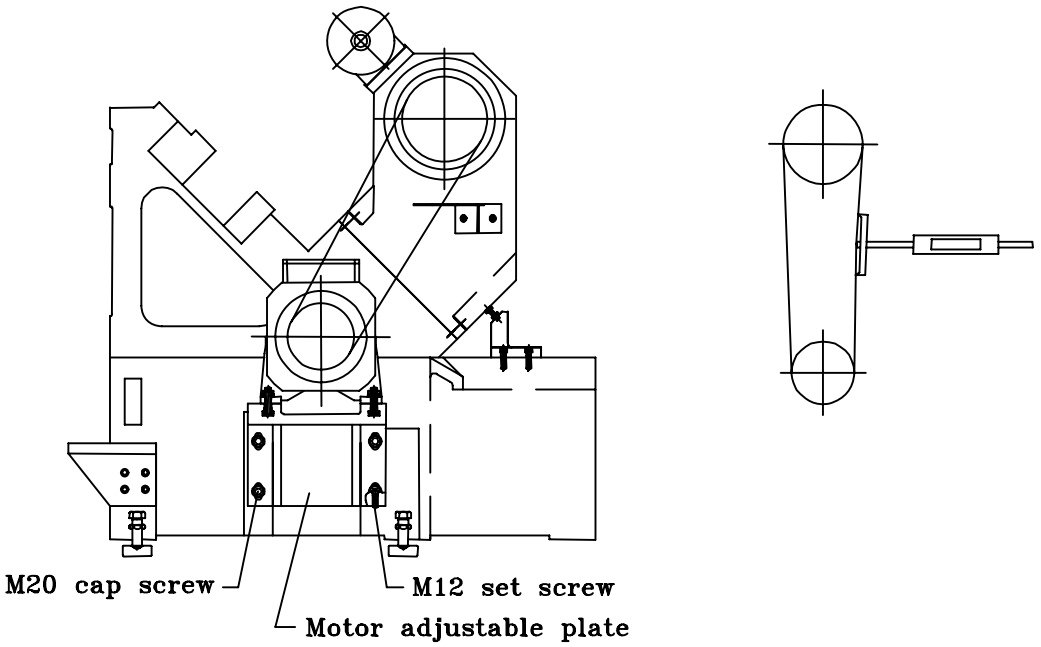
9.5.1 Loosen the M8 set caps screw on the main motor fixed plate and motor adjustable plate.

9.5.2 Loosen the M8 set caps screw inside or outside of the main motor fixed plate to adjust main motor, and make the belt tighten, then measure the tension of belt with tension meter to make sure if it fits to machine's require.

Tension load : 4.0 kgs ~ 4.5 kgs

9.5.3 Then tighten nuts of the adjustable screw and six screws (M8) of the main motor adjustable plate.

☞ ※ Note: For new machine adjust belt every three months, after a period time operating adjust belt every six months.

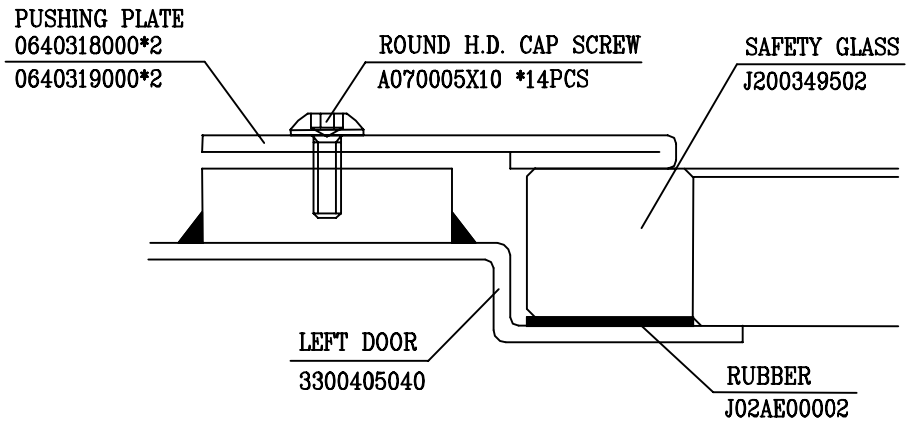


9.6 Replacement Procedures of the Safety Glass

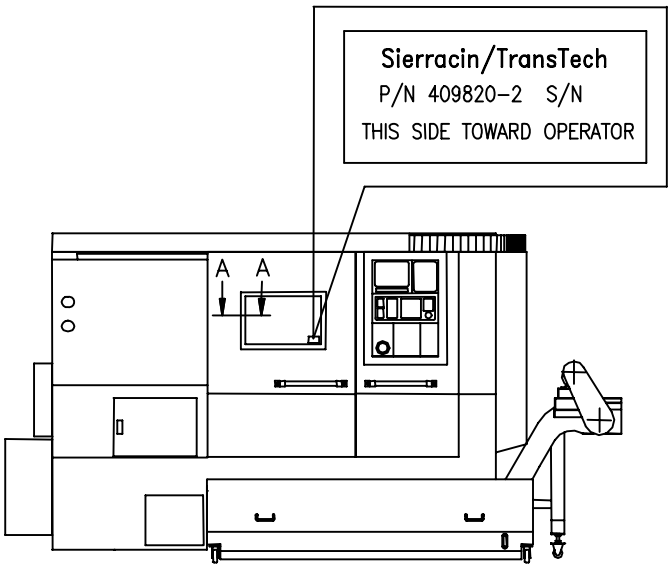
9.6.1 First remove the chip door out of the machine and clean the broken glass.

9.6.2 Before putting new glass, apply anti-leak liquid in the door frame and put the safety glass No.J200349502 of the door inside.

9.6.3 Then fasten the two pushing plate No.0640318000 and No.0640319000 to the new glass into the chip door.



SEC:A–A



MEMO